



Imperial®
DEPENDABLE UNDER PRESSURE®

Professional Tools

HVACR Service
Tube Working
Specialty Pliers



**STRIDE
TOOL**

**GLENWILLOW, OHIO
U.S.A**



Professional Tools

HVACR Service
Tube Working
Specialty Pliers

Imperial is the flagship brand of Stride Tool, LLC headquartered in Glenwillow, Ohio.

With roots dating back over 110 years, Imperial® specialty tools are designed and manufactured to exacting standards, and have earned an international reputation for quality and dependability. Imperial tools are used by professional technicians in a wide range of service and industrial applications, including heating, air conditioning, refrigeration, tube working, electrical and automotive.

1905 Imperial Brass Manufacturing Company, a pioneer in the manufacturing of brass valves and fittings, is founded in Chicago, Illinois.

1995 The Milbar Corporation, a Chagrin Falls, Ohio specialty tool manufacturer, is acquired by Stride Tool. **MILBAR®** brand safety wire twisters have been designed and manufactured in northeast Ohio for over 60 years.

1996 Stride Tool acquires the tool and accessory division of Imperial Eastman (formerly Imperial Brass) located in Niles, Illinois. The Imperial brand name, with its legacy of innovation and excellence, expands to additional product lines under Stride Tool.

2004 New corporate headquarters and centralized manufacturing facility opens in Glenwillow, Ohio.







2012 Thermal Engineering Company of Mentor, Ohio, manufacturer of vacuum gauges, compressor tools, oil pumps, vacuum pumps and other HVACR service accessories for over 40 years, is acquired and joins the Imperial line.









GLENWILLOW, OHIO
U.S.A.

TABLE OF CONTENTS

















TUBE WORKING TOOLS

TUBE CUTTERS	1-4	
TUBE BENDERS	4-10	
FLARING & SWAGING	11-18	
TUBING TOOL KITS	19-20	
TUBING TOOL SELECTOR	21	
ACCESSORIES & WRENCHES	22-24	

REFRIGERATION AND AIR-CONDITIONING PRODUCTS

MANIFOLDS	25-29	
MANIFOLDS REFERENCE GUIDES	30-34	
GAUGES	35	
VACUUM GAUGES	36	
HOSES	37-38	
COUPLERS	39-40	
ACCESSORIES & TOOLS	41-45	
OIL PUMPS & ACCESSORIES	45	
VACUUM PUMP ACCESSORIES	46	
CHARGING CYLINDERS & ACC.	47	
COMPRESSOR TOOLS	48	
LEAK DETECTION	49-50	

ELECTRICAL TOOLS

STRIPPERS & CRIMPERS	51-55	
REFERENCE GUIDE	56	
RETAINING RING PLIERS		
CONVERTIBLE	57-59	
FIXED TIP	60	
REPLACEABLE TIP	61-62	
LOCK RING	63	
REPLACEABLE TIPS	64	
REFERENCE GUIDES	65-68	
WIRE TWISTING PLIERS		
REVERSIBLE	69	
WIRE TWISTERS	70-73	
AUTOMOTIVE SPECIALTY TOOLS		
OIL CHANGING TOOLS	74	
BATTERY & ENGINE	75-77	
GENERAL AUTO TOOLS	78-79	
GENERAL		
GENERAL TOOLS	79	
MERCHANDISING	80	
ALPHA-INDEX	81-84	

METAL TUBING

HI-DUTY® TUBE CUTTERS

For 1/8" to 1-1/8" and 1/4" to 1-5/8" O.D. tubing.

- Enclosed hardened steel, thrust bearing feed mechanism for smoothest cutting action and trouble free operation.
- Unique design eliminates spiraling for clean right angle cuts. Our high precision machining and construction method permits one-piece screw-type axle for easy access to cutter wheel – no clip to lose or replace.
- Rugged aluminum alloy body designed for handling ease. Body is hand buffed and nickel chrome plated to a high-luster finish.
- Foldaway hardened steel reamer with turned cutting edge removes inside burrs cleanly. Filing surface removes outside burrs.
- Rollers feature flare cut-off groove to reduce tube loss when damaged flare is removed.
- Imperial® cutter wheels are made of the highest quality wear and abrasion-resistant chromium steel and precision machined to exacting specifications for accurate cutting and long life. Each tool is supplied with a spare cutter wheel.
- All Imperial tube cutters are 100% factory tested to ensure accurate spiral-free cutting.



TC-1000

TC-1000 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75015 general purpose cutter wheels. Length 5". Wt. 8.8 oz.

TC-1010 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75046 cutter wheels for continuous cutting of stainless steel, monel and other hard-temper tubing. Length 5". Wt. 8.8 oz.

TC-1020 Combination tube constrictor & tube cutter. For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes S76637 constrictor wheel and S75015 general purpose cutter wheel. Length 5-1/2". Wt. 8.8 oz.

312-FC For 1/4" to 1-5/8" (7 mm to 41 mm) O.D. tubing. Includes (2) S75015 general purpose cutter wheels. Length 5-1/2". Wt. 10.4 oz.

Conforms to Federal Specification GGG-C-771d, Type II, Class I.

S75015 General purpose cutter wheel.

S75046 Wheel for continuous cutting of stainless steel, monel and other hard temper tubing. For cutters TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050 and TC-3050.

S16003162 Replacement cutter wheel for soft copper & aluminum tubing is extra sharp to minimize burr buildup.

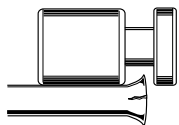
S76637 Constrictor wheel for producing sweat joints.



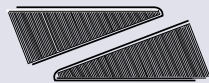
TC-1010



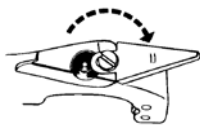
312-FC



FLARE CUT-OFF GROOVE
Groove in rollers reduces tube loss when cracked flare is removed.

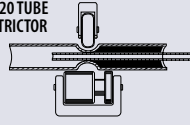


FOLDAWAY REAMER
Hardened steel reamer with turned cutting edge removes inside burrs cleanly. Filing surface removes outside burrs.



SPARE CUTTING WHEEL
Spare cutter wheel carried under foldaway locking reamer.

TC-1020 TUBE CONSTRICTOR



FILL WITH SOLDER
Joint is ready for sweating when constricted tube contacts smaller tube. Can be used for crimping applications.

JUNIOR TUBE CUTTER

For 1/8" to 3/4" (4 mm to 19 mm) O.D. tubing.

227-FA Includes S32633 general purpose cutter wheel. Swing radius 2". Length 3-1/2". Wt. 5.0 oz.



227-FA

METAL TUBING

"IMP"® MINI TUBE CUTTERS

For 1/8" to 5/8", 3/16" to 7/8" and 1/8" to 1-1/8" O.D. tubing.

- Big capacity, small size tube cutters designed for use in tight quarters where other cutters won't fit.
- Enclosed feed screw minimizes contamination assuring continued smooth operation.
- Corrosion-resistant steel rollers positioned at bottom of cutter allow for easier cutter engagement on tubing and smoother cutting action.
- All Imperial® tube cutters are 100% factory tested to ensure accurate spiral-free cutting.

TC-1050 For 1/8" to 5/8" (4 mm to 15 mm) O.D. tubing. Includes (1) S32633 general purpose cutter wheel. Swing radius 1-1/4" (1-3/8" swing radius with 5/8" tube). Length 1-3/4". Wt. 2.5 oz.

S32633 General purpose cutter wheel for TC-1050.

S26883 Screw for TC-1050 cutter wheel.

TC-2050 For 3/16" to 7/8" (5 mm to 22 mm) O.D. tubing. Includes (1) S75015 general purpose cutter wheel. Swing radius 1-11/16". Length 2-1/4". Wt. 4.0 oz.

TC-3050 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (1) S75015 general purpose cutter wheel. Swing radius 2-1/2" (2-1/16" swing radius with 1-1/8" tube). Length 3". Wt. 7.0 oz.

S75015 General purpose cutter wheel.

S74762 Screw for TC-3050 cutter wheel.

RATCHETING TUBE CUTTERS

For 1/8" to 5/8" and 1/8" to 1-1/8" O.D. tubing.

- Easily completes a full revolution, maximizing leverage.
- Cutter can easily be removed from the handle.
- Ergonomic handle with non-slip grip.
- Six independent drive pawls provide 15° arc-swing.
- Includes (1) general purpose cutter wheel.

TC-1050RH For 1/8" to 5/8" (4 mm to 15 mm) O.D. tubing. 2-Pc. set includes TC-1050 "IMP"® mini tube cutter and ratcheting handle in clamshell packaging. Length 5". Wt. 6.0 oz.

TC-1051 Ratcheting handle only. Length 5". Wt. 1.5 oz.

TC-3050RH For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. 3-Pc. set includes TC-3050 "IMP"® tube cutter, removable deburr tool and ratcheting handle in clamshell packaging. Length 7". Wt. 11.5 oz.

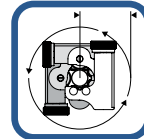
TC-3051 Ratcheting handle and deburr tool. Length 7". Wt. 4.0 oz.



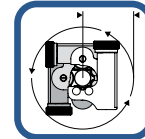
TC-1050

TC-2050

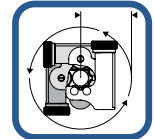
TC-3050



Swing Radius
1-1/4"



Swing Radius
1-11/16"



Swing Radius
2-1/2"

Use cutter with or without patented ratcheting handle - snaps into place in seconds

TC-3050RH includes a removable deburr tool



PATENTED

Ergonomic handle with non-slip grip

Ideal for tight spaces

TC-3050RH



Removable Deburr Tool
(TC-3050RH and TC-3051)

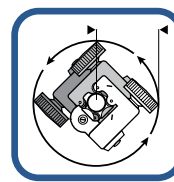
Six independent drive pawls give small, 15° arc-swing



BIG "IMP"® TUBE CUTTER - "Big capacity in small size"

For 3/8" to 1-1/8" (10 mm to 28 mm) O.D. tubing.

174-F Includes (2) S75015 general purpose cutter wheels. Swing radius 1-15/16" (2-1/4" swing radius with 1-1/8" tube). Length 2-11/16". Wt. 5.0 oz.



Swing Radius
1-15/16"

174-F



S75015 - Spare cutting wheel

METAL TUBING

ADJUST-O-MATIC™ TUBE CUTTERS

For 3/8" to 2-5/8" and 2" to 4-1/8" O.D. tubing.

- Ratchet feed mechanism speeds up cutting operation.
- Extra wide rollers with flare cut-off groove stabilize tubing.
- Spare cutting wheel included under handle cap.
- Enclosed screw-type feed mechanism; lightweight aluminum alloy body.

206-FB For 3/8" to 2-5/8" (10 mm to 66 mm) O.D. tubing. Includes (2) S74761 general purpose cutter wheels. Length closed 7-3/4". Wt. 2.0 lbs.

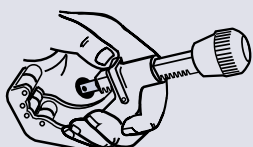
406-FA For 2" to 4-1/8" (51 mm to 104 mm) O.D. tubing. Includes (2) S74833 general purpose cutter wheels. Length closed 11-1/4". Wt. 3.5 lbs.

Conforms to Federal Specification GGG-C-771d, Type II, Class I.



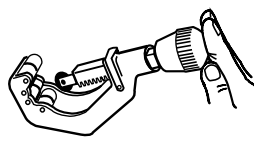
406-FA

206-FB



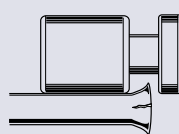
RATCHET FEED

Ratchet release opens cutter instantly to maximum size.



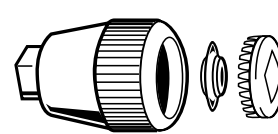
RATCHET FEED

Push on handle to slide cutter wheel to tubing. Rotate handle for fine adjustment.



FLARE CUT-OFF GROOVE

Wide flare cut-off groove in rollers to accommodate flares on large size tubing.



SPARE CUTTING WHEEL

Spare cutter wheel included in handle under snap-off cap.

144-F IMPERIAL® TUBE CUTTER SERVICE CENTER

For 1/8" to 4-1/8" O.D. tubing.

Selling Imperial® replacement cutter wheels, reamer blades and fasteners is easy. Our Service Center organizes a popular selection of replacement parts for Imperial cutters. Display on the counter or bring it with you when making sales calls.

- 15 most common replacement parts stocked in one handy container.
- Includes a visual replacement chart for quick and easy identification.



144-F

144-F SERVICE CENTER INCLUDES:

PART NO.	QUANTITY	DESCRIPTION	CUTTER
S75015	10	General Purpose Cutter Wheel	TC-1000, TC-1010, 312-FC, 174-F, TC-2050, TC-3050
S75046	5	Cutter Wheel for Stainless Steel	TC-1000, TC-1010, 312-FC, 174-F, TC-2050, TC-3050
S32633	10	Cutter Wheel	TC-1050, 227-FA
S74761	5	Cutter Wheel	206-FB, 206-FBP
S74762	5	Cutter Wheel Retaining Screw	TC-1000, TC-1010, 312-FC, 174-F, TC-2050, TC-3050
S74833	3	Cutter Wheel	406-FA
S26883	3	Cutter Wheel Retaining Screw	TC-1050
S77511	3	Cutter Wheel Retaining Screw	206-FB, 206-FBP
S74834	3	Cutter Wheel Retaining Screw	406-FA
S76637	3	Constrictor Roller Wheel	TC-1000, TC-1010, TC-1020, 312-FC
S16003162	5	Cutter Wheel for Soft Copper Only	TC-1000, TC-1010, 312-FC, 174-F, TC-2050, TC-3050
S10000770	3	Cutter Wheel for PVC	206-FB, 206-FBP
S7931801	3	Reamer Blade	TC-1000, TC-1010, 312-FC
S8201501	3	Retaining Screw for Reamer Blade	TC-1000, TC-1010, 312-FC
S74197	3	Spring Washer for Reamer Blade	TC-1000, TC-1010, 312-FC
144-FB	1	Container only	

PVC, PLASTIC AND NON-METAL REINFORCED TUBING

PLASTIC TUBE AND HOSE SHEARS

For 1/16" to 13/16" (1 mm to 20 mm) O.D. hose* or tubing.

307-FP

Snimp™ Compact shear for 1/16" to 1/2" (1 mm to 13 mm) O.D. plastic tubing and non-metal reinforced hose. Spring loaded for safety - closes automatically. Includes S8115601 replaceable hardened steel blade. Length 2-7/8". Wt. 1.0 oz. each. Comes in 12-pc. pop-up counter display. 9"D x 12"W x 12"H.

327-FP

For 1/8" to 13/16" (4 mm to 20 mm) O.D. plastic tubing and non-metal reinforced hose. Can be wall- or bench-mounted for production, or carried in a toolbox. Includes S77615 replaceable hardened steel blade. Length 9-3/4". Wt. 1.0 lb.

* Not for use with metal reinforced hose.



307-FP



327-FP



307-FP POP-UP DISPLAY

TUBE BENDERS

For soft copper and aluminum tubing.

TUBE BENDERS

SPRING TYPE TUBE BENDERS

For soft copper and aluminum tubing.

For 1/4" to 7/8" O.D. tubing.

Tools allow hand bending of soft tubing to any shape without collapsing walls. Special spring steel, zinc finish. End belled for quick tube removal.

201-F

Set of 8 benders for 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" and 7/8" O.D. tubing.

101-F

Set of 6 benders for 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8" O.D. tubing.

163-F

Set of 4 benders for 1/4", 3/8", 1/2" and 5/8" O.D. tubing.

112-F

Set of 3 benders for 1/4", 5/16" and 3/8" O.D. tubing.



102-F-08

PART NO.	TUBE O.D. (in.)	LENGTH (in.)	WEIGHT EACH (OZ.)
102-F-04	1/4	10	3
102-F-05	5/16	10	3
102-F-06	3/8	10	4
102-F-07	7/16	12	6.25
102-F-08	1/2	12	6.5
102-F-10	5/8	12	8
102-F-12	3/4	12	10
102-F-14	7/8	12	10

Each tool bends only one size.

TRIPLE HEAD LEVER TYPE

470-FH TRIPLE HEAD 180° TUBE BENDER WITH ROTO-LOK™ INDEXING HANDLE

- Bends 3/16", 1/4", 5/16" and 3/8" O.D. tubing.
- Patented, quick-action indexing lever repositions two-stage handle midway through bend when both handles begin to meet. This feature allows easy fabrication of bends up to 180° with reduced effort, better control and no crossing of handles!
- Optimum bending radius – for each tubing size.
- Calibrated markings – for making accurate left-hand, right-hand and offset bends.
- Compact design for working in tight spaces.
- Cushion grips – for comfort and stability.
- Made of lightweight, die-cast aluminum.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/16	9/16
1/4	9/16
5/16	11/16
3/8	15/16



Patented Roto-Lok™ Indexing Lever - Smooth, tight 180° bends with less effort and improved control

Lightweight die-cast aluminum

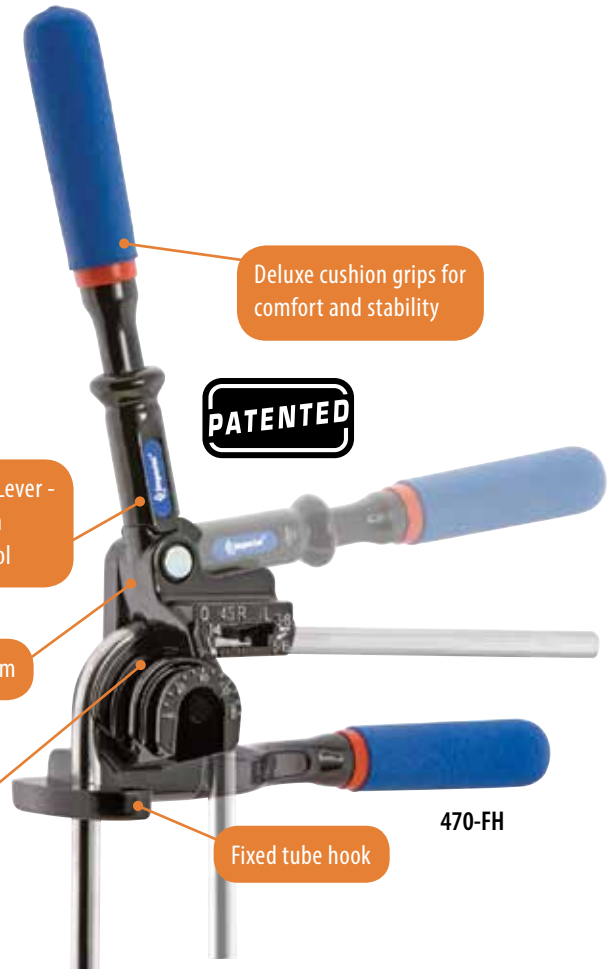
Bends 3/16", 1/4", 5/16" and 3/8" O.D. tubing

Deluxe cushion grips for comfort and stability

PATENTED

Fixed tube hook

470-FH



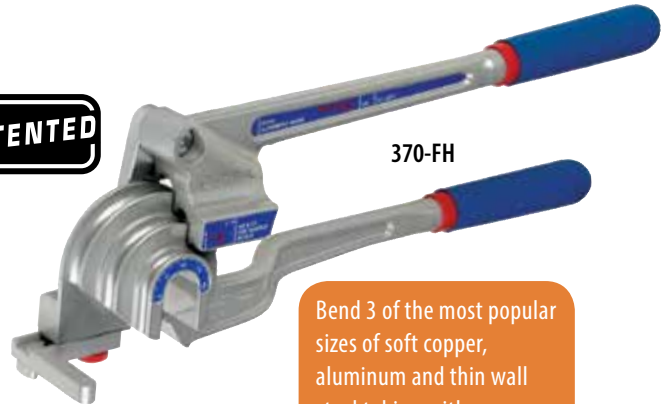
TRIPLE HEAD LEVER TYPE

370-FH TRIPLE HEAD 180° TUBE BENDER

- Bends 3/16", 1/4", 3/8" and 1/2" tubing.
- Makes smooth, tight-radius 180° bends.
- Calibrated markings – for making accurate left-hand, right-hand and offset bends.
- Adjustable hook.
- Optimum bending radius – for each tubing size.
- Cushion grips – for extreme comfort.
- Made of lightweight die-cast aluminum.

PATENTED

370-FH



Bend 3 of the most popular sizes of soft copper, aluminum and thin wall steel tubing with one rugged, precise tool!

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/16	11/16
1/4	11/16
3/8	1-1/8
1/2	1-1/2



Easy 180° bends in one swift motion



IMP™ TRIPLE HEAD BENDERS

- Bends soft copper, aluminum and thin wall steel tubing.
- Bends 1/8", 3/16", 1/4", 5/16", and 3/8" tubing.
- Makes smooth, tight-radius 90° bends.
- Calibrated markings – for making accurate left-hand, right-hand and offset bends.
- 90° start requires less effort – making bending fast and easy.
- Made of lightweight die-cast aluminum.

367-FH For 1/8", 3/16" and 1/4" (3 mm, 4 mm and 6 mm) O.D. tubing. Wt. 0.5 lbs.

368-FH For 3/16", 1/4", 5/16" and 3/8" (6 mm and 8 mm) O.D. tubing. Wt. 1.0 lbs.

367-FH

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE	
	(in.)	(mm)
1/8	5/8	16
3/16	19/32	15
1/4	9/16	14

368-FH

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE	
	(in.)	(mm)
3/16	1-1/64	26
1/4	1-1/64	26
5/16	1	25
3/8	15/16	24



367-FH



368-FH

LEVER TYPE

364-FHA LEVER TYPE TUBE BENDERS

For 1/8" to 1" and 6 mm to 12 mm O.D. tubing.

Each tool bends one size. Open-side type which slips over tube at any point. Makes smooth, tight radius bends up to 180° with minimum effort. No scoring or flattening of tubing. Calibrated to show angle of bend. Wide hook grips tubing securely.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
364-FH-02	1/8	3/8	0.5
364-FH-03	3/16	7/16	0.5
364-FHA-04	1/4	9/16	1.0
364-FHA-05	5/16	11/16	1.0
364-FHA-06	3/8	15/16	1.75
364-FHA-08	1/2	1-1/2	3.5
364-FHA-10*	5/8	2-1/4	5.5
364-FHA-12*	3/4	3	7.0
364-FHA-14*	7/8	3	10.5
364-FHA-16*	1	3-1/2	10.5

Each tool bends only one size.

Conforms to Federal Specification GGG-B-191a Type III, Class 2.

* For bending annealed copper and aluminum tubing only.

364-FHA-14

Features telescopic handles for increased leverage.

Expandable style furnished for 7/8" and 1" O.D. tubing.



364-FHA-06

Style for 1/4" through 1/2" and 6 mm to 12 mm O.D. tubing.



364-FH-02

Style for 1/8" and 3/16" O.D. tubing.



364-FHA-10

Style for 5/8" and 3/4" O.D. tubing.

METRIC SIZE BENDING TOOLS

PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE		WEIGHT EACH	
		(mm)	(inches)	(kg.)	(lbs.)
364-FHAM-6MM	6	14.2	9/16	0.45	1.0
364-FHAM-10MM	10	24.0	15/16	0.79	1.75
364-FHAM-12MM	12	38.1	1-1/2	1.6	3.5

Each tool bends only one size.

364-FHB SWIVEL HANDLE TUBE BENDERS

For 1/4" to 1/2" and 6 mm to 12 mm O.D. tubing.

The 364-FHB series has a swivel handle that can be repositioned midway through a bend when both handles begin to meet. This simple feature allows easy fabrication of bends up to 180° with reduced effort, better control and without the crossing of handles, typical of most other lever type benders.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
364-FHB-04	1/4	9/16	1.0
364-FHB-05	5/16	11/16	1.0
364-FHB-06	3/8	15/16	1.75
364-FHB-07	7/16	1-1/2	3.5
364-FHB-08	1/2	1-1/2	3.5

Each tool bends only one size.

Conforms to Federal Specification GGG-B-191a Type III, Class 2.

METRIC SIZE BENDING TOOLS

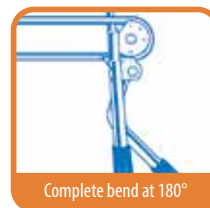
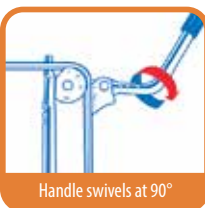
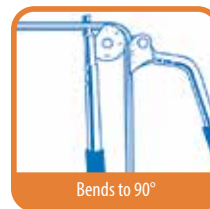
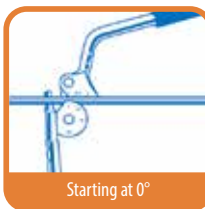
PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE		WEIGHT EACH	
		(mm)	(inches)	(kg.)	(lbs.)
364-FHBM-6MM	6	14.2	9/16	0.45	1.0
364-FHBM-8MM	8	17.5	11/16	0.45	1.0
364-FHBM-12MM	12	38.1	1-1/2	1.6	3.5

Each tool bends only one size.



364-FHB-06

Style for 1/4" through 1/2" and 6 mm to 12 mm O.D. tubing.



HEAVY DUTY LEVER TYPE

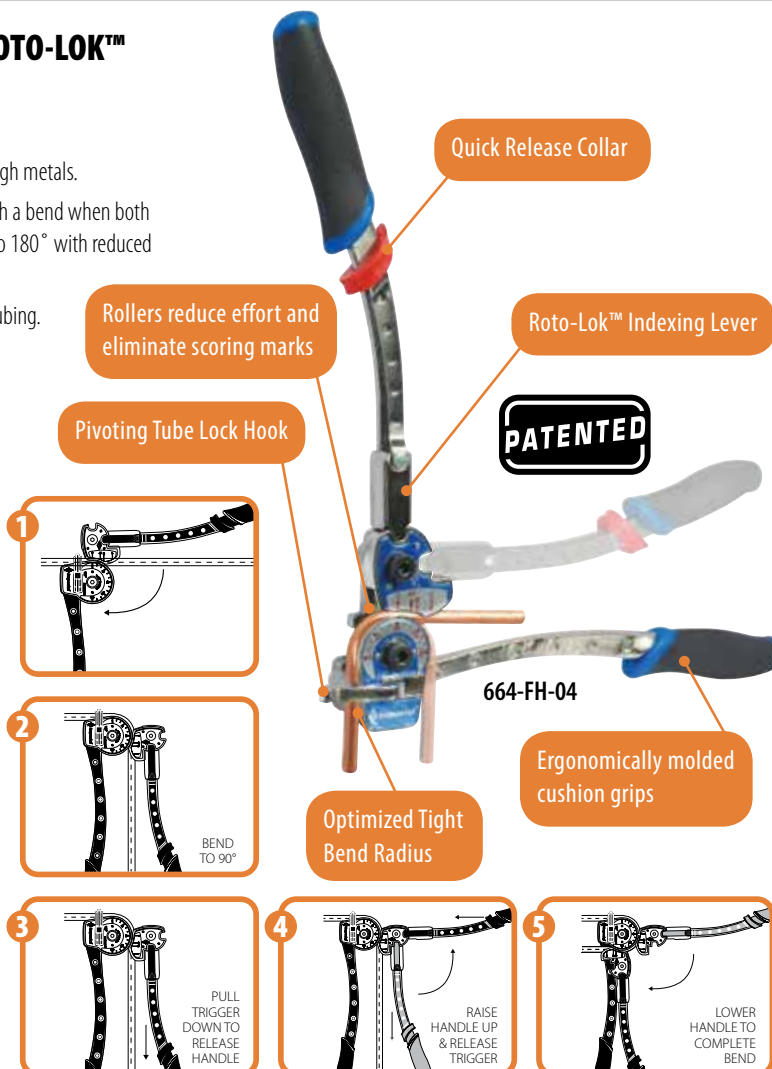
664-FH HEAVY-DUTY 180° TUBE BENDER WITH ROTO-LOK™ INDEXING HANDLE FOR TIGHT RADIUS BENDS

For 1/4" to 1/2" and 6 mm to 12 mm O.D. tubing.

- New design for accurate and tight bends up to 180° in stainless steel and other tough metals.
- Patented, quick action trigger release repositions two-stage handle midway through a bend when both handles begin to meet. This feature allows easy fabrication of optimized bends up to 180° with reduced effort, better control and no crossing of handles!
- Rollers in bending handle reduce friction and bending effort; eliminate scoring of tubing.
- Patented ergonomic grips.
- Durable nickel finish.
- Vise lug for mounting in vise.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
664-FH-04	1/4	9/16	1.2
664-FH-06	3/8	15/16	3.7
664-FH-08	1/2	1-1/2	7.6

PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE (mm)	WEIGHT EACH (lbs.)
664-FH-6MM	6	15	1.2
664-FH-8MM	8	24	3.7
664-FH-10MM	10	24	3.7
664-FH-12MM	12	38	7.6



564-FH LEVER TYPE HEAVY-DUTY TUBE BENDER

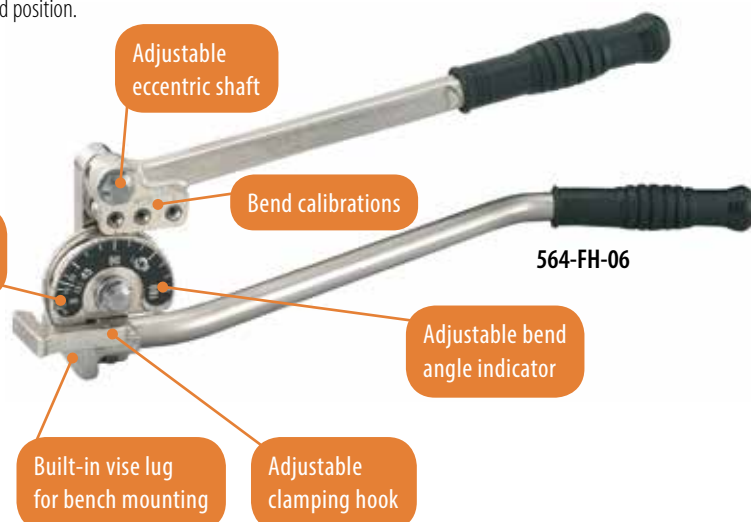
For 3/8" and 1/2" O.D. tubing.

This heavy-duty tube bender features high-strength tool steel construction on all components subjected to stress during the bending process – including forming rollers, form wheel, stop pins, hook and cam adjustment shaft. Unique offset handle design assures maximum power transfer between worker and bender. Bender will not “gyrate” as handles are brought to closed position.

- Meets ANSI B31.1/ASME Sec. 3 Boiler/Power requirements.
- Vise mountable.
- Prevents slippage and flattening.
- Fully adjustable to compensate for variances in tube tolerance.
- Starts with handles at 90° angle.
- Built for rugged day-in and day-out use.
- Precise bends!
- Self-aligning rollers eliminate scoring and reduce bending effort.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
564-FH-06	3/8	1-1/8	5.5
564-FH-08	1/2	1-1/2	7.0

Each tool bends only one size.



LEVER TYPE KITS

WIDE RANGE TUBE BENDER KITS

For 1/4" to 7/8" O.D. tubing.

Each tool quickly adapts to all sizes in its range by changing forming wheel and block. Telescopic handles reposition during bend for best leverage. Calibrations show precise bend angle. One-piece benders furnished for 1/4" and 5/16" O.D. sizes. Includes metal tool case with space for other tools needed on the job.

Conforms to Federal Specification GGG-B-191a Type III, Class 1.

260-FHA for 7 sizes. Wt. 23 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	9/16
5/16	11/16
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3
7/8*	3

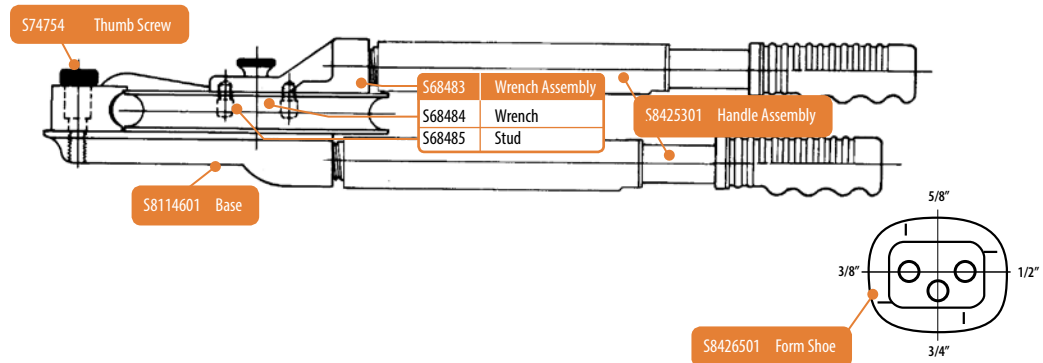
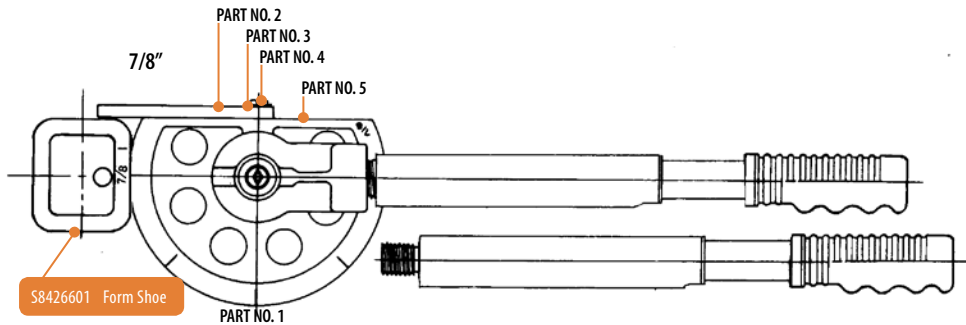
All wide range benders furnished in tool case with space for other tools.



260-FHA

350-FHA for 6 sizes. Wt. 20 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	9/16
5/16	11/16
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3

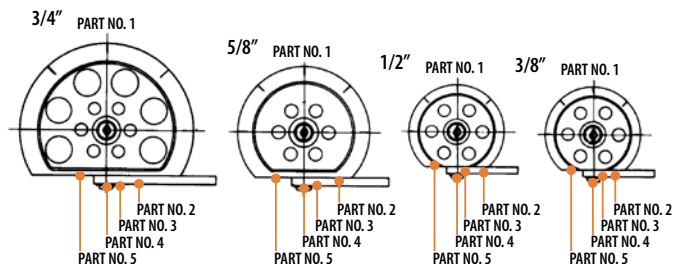


360-FHA for 4 sizes. Wt. 20 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3

* Recommended for bending annealed copper and aluminum tubing only.

Size (in.)	PART NO. 1 (Wheel Assembly)	PART NO. 2 (Hook)	PART NO. 3 (Spring Washer)	PART NO. 4 (Hook Screw)	PART NO. 5 (Form Wheel)
3/8	-	S68480	S68481	S66914	S68479
1/2	S68492	S62156	S68481	S66914	S68493
5/8	S68496	S8058801	S68481	S66914	S68497
3/4	S8487001	S8058901	S68481	S66914	S8442401
7/8	S8485201	S68502	S68481	S66914	-



GEAR TYPE

270-F GEAR TYPE TUBE BENDER

For 3/4" to 1-1/8" O.D. tubing.

For all bending work. Spur-gear type with 10-to-1 ratio for easy bending of tempered tubing. Floating shoe aligns tube perfectly on calibrated forming wheel. Pull-pin on wheel speeds repositioning for bends over 90°. Portable. Can be hand held, clamped in vise or bolted to bench. Adapts to pipe vise with handle 271-F.

Each tool bends only one size.

PART NO.	TUBE O.D. (in.)	RADIUS FROM CTR. TO CENTER OF TUBE (in.)	MIN. RETURN FROM CENTER TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)	WALL THICKNESS (in.)
270-F-12	3/4	4	9-1/2	15	.042 to .083
270-F-14	7/8	4	9-1/2	14.75	.045 to .083
270-F-16	1	4	9-1/2	14.75	.065 to .095*
270-F-18	1-1/8	4	9-1/2	14.25	.065 to .095*

271-F Pipe Vise Extension. Fits all 270-F benders. Wt. 1.75 lbs.

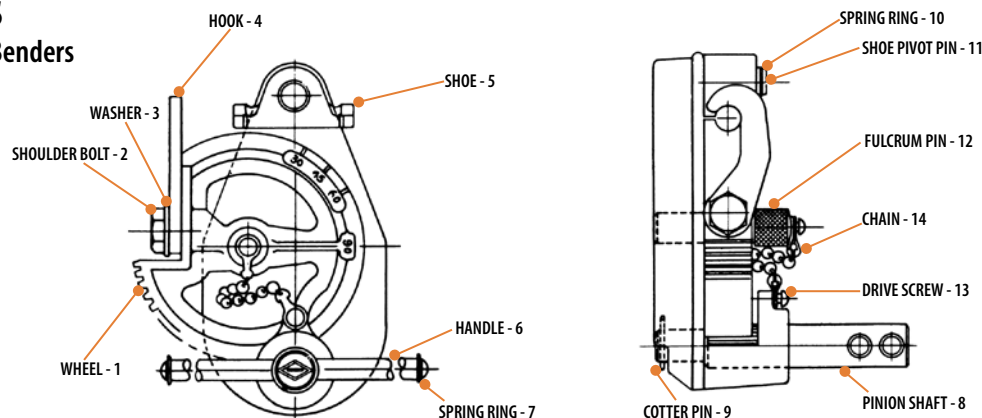
* Not recommended for Type L Hard and Type M copper tubing with wall thickness over .065".



270-F

REPLACEMENT PARTS

For 270-F Gear Type Tube Benders



TUBE BENDER	Size (in.)	PART NO. 1	PART NO. 2	PART NO. 3	PART NO. 4	PART NO. 5	PART NO. 6	PART NO. 7	PART NO. 8	PART NO. 9	PART NO. 10	PART NO. 11	PART NO. 12	PART NO. 13	PART NO. 14
270-F-12	3/4	S62305	S62294	S62298	S62307	S62306	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-14	7/8	S62302	S62294	S62298	S62304	S62303	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-16	1	S62299	S62294	S62298	S62301	S62300	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-18	1-1/8	S62287	S62294	S62298	S62290	S62289	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837

WORM GEAR TUBE BENDER

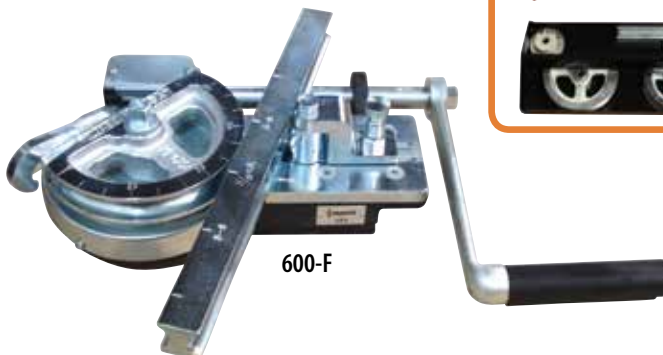
For 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

600-F Precision tool for highest quality work. 50-to-1 gear ratio and crank with revolving hand grip keeps effort at a minimum. Follow bar eliminates drawing action and keeps tube in virtually perfect round. Adjustable pressure roller positions quickly in index holes. Enclosed gears. Includes metal tool case. Can be clamped in vise or bolted to bench or tripod. Size of kit: 14" x 9" x 6". Wt. 35.0 lbs.

Tube Wall Thickness and Bend Radius

TUBE O.D. (in.)	WALL THICKNESS (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	.016 to .049	3/4
5/16	.020 to .065	1
3/8	.028 to .083	1-1/4
1/2	.035 to .083	2
5/8	.042 to .083	2-1/2
3/4	.049 to .083	3

Conforms to Federal Specification GGG-B-191b, Type I, Class 2.
Meets ANSI Specification (B31.1) and ASME Section III Nuclear Code.



600-F



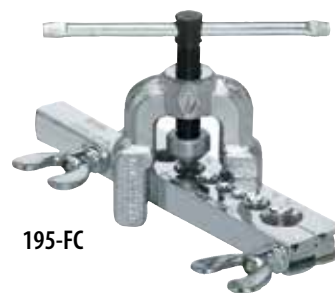
45° FLARING TOOLS

45° FLARING TOOL

For 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8" O.D. tubing.

195-FC Flares 7 sizes of tubing. Rugged forged steel slip-on yoke and hardened flaring bar. Positive clamping action of bars prevents tube slippage. Self-centering yoke with swivel-type, hardened steel, chrome finished flaring cone forms better flares with less effort. Design of yoke permits flaring where there is little space between nut and tube end. Satin finish nickel chrome plated. Wt. 2.0 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	7/16	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035	.035



195-FC

45° LARGE SIZE FLARING TOOLS

Flares larger tube sizes. Quick slip-on yoke with hardened steel, chrome finished swivel flaring cone reduces effort. Positive clamping action of flaring bar eliminates tube movement. Nickel chrome finish.

Conforms to Federal Specification GGG-F-451a Type 1, Class 2, Style A.

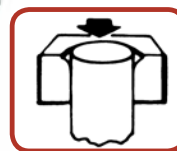
103-FS For sizes 3/4", 7/8" and 1" O.D. tubing. Wt. 3.75 lbs.

203-FA For sizes 5/8", 3/4", 7/8" and 1-1/8" O.D. tubing. Wt. 3.75 lbs.

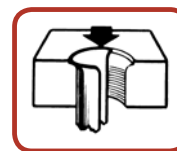
375-FS For sizes 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing. Includes tool case. Wt. 3.75 lbs.



103-FS



SELF GAUGING - Just insert tube flush with top of die for accurate flare size.



FORMS STRONGER FLARES - Stronger flares assured by smooth, even radius formed at base of every flare by engineered chamfer.

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1-1/8
Wall Thickness	(in.)	.025	.028	.035	.035	.035	.035	.035	.049	.049	.049	.058	.058

HI-DUTY® 45° FLARING TOOL

For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

300-FB Hardened steel, chrome finished cone makes exceptionally smooth, high strength flares with a radius at base of flare - instead of the sharp angle formed by ordinary tools. Slip-on yoke permits use in tight quarters, allows flaring where there is little space between nut and tube end. New feed screw design provides smoother, easier operation. Positive gripping and self-gauging of tube for exact flare size. Sliding die blocks lock in place by lever clamp action to ensure even dispersal of force around full diameter of tube for superior grip. Wt. 1.6 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



300-FB

45° ROL-AIR™ FLARING TOOLS

45° ROL-AIR™ FLARING TOOL

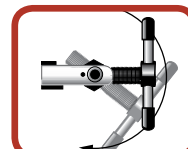
Flares and burnishes 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

500-FC Faceted, hardened steel, chrome finished cone rolls out perfect 45° flares above die block, and automatically burnishes flare face reducing the need for deburring. Original wall thickness is maintained at base of flare. Slip-on yoke permits use in tight quarters, where there is little space between nut and tube end. Larger handle, with better leverage, and precision threads on feed screw make flaring effortless. Heat treated dies grip tubing without scoring. Satin chrome and black finish. Wt. 1.5 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



Flares rolled out above die bar by super-smooth faceted cone. Makes stronger flares.



Unique detention mechanism for rapid engagement and release of die blocks.



500-FC

WORKS WITH
R-410A

45° ROL-AIR™ FLARING TOOLS

“GRABBER”™ ROL-AIR™ 45° FLARING TOOL

Universal application. Adjustable opening holds all sizes.

Flares and burnishes 3/16" to 5/8" (4.75 mm to 16 mm) O.D. tubing.

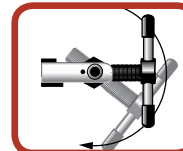
525-F Unique, self-adjusting, tube holding mechanism permits flaring any size tubing within the range of 3/16" to 5/8" (4.75 mm to 16 mm) O.D. Innovative, single-opening design is more compact and easier to use than conventional multi-opening flaring bars. Faceted, hardened steel, chrome finished cone rolls out and burnishes perfect 45° flare above the tube-holding mechanism reducing need for deburring. Original wall thickness is maintained at base of flare. Slip-on self-centering yoke permits use in tight quarters. Large handle, with better leverage, and precision threads on feed screw make flaring effortless. High quality construction with satin chrome and black finish. Wt. 1.75 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035

Outside Tube Diameter	(mm)	4.75	6	8	10	12	15	16
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0

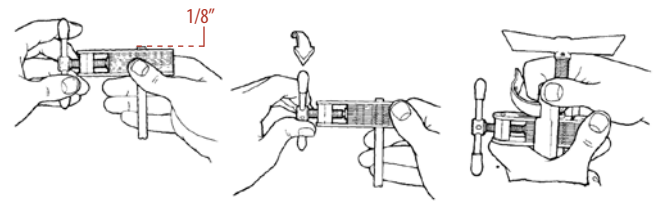


Flares rolled out above die bar by super-smooth faceted cone. Makes stronger flares.



Unique detention mechanism for rapid engagement and release of die blocks.

- (1) Insert tubing into adjustable opening of tube-holding assembly. Position end of tubing approximately 1/8" above the surface of holder.
- (2) Tighten clamp screw approximately 1/2 to 3/4 of a turn beyond free travel position to secure tubing.
- (3) Be certain flaring cone surface is oiled. Slip yoke over tube-holding assembly centering on tubing. Twist yoke clockwise to lock in position. Turn yoke handle clockwise to flare.



45° DOUBLE FLARING TOOLS

45° DOUBLE FLARING TOOL

For 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

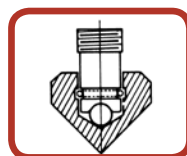
93-FB Recommended for Bundy and other annealed soft steel tubing (wall thickness to .035"). Also makes single or double flares in soft copper or aluminum tubing. Small, lightweight, easy to handle. Steel yoke; swivel-type hardened steel, chrome finished flaring cone. Bar provides positive grip of tubing. Includes tool case. Wt. 3.0 lbs.
Conforms to Federal Specification GGG-F-451a, Type 1, Class 2, Style A.



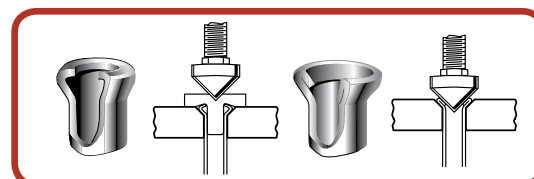
93-FB



93-FB



SWIVEL-TYPE BALL BEARING CONE - Ball thrust bearing in flaring cone minimizes friction, makes operation easier.



DOUBLE FLARING ADAPTERS-

Screw down flaring cone with proper size adapter in tube. Retract cone, remove adapter, complete flare.

37° FLARING TOOLS

37° FLARING TOOL

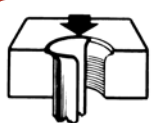
For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

437-FB For use with soft copper, aluminum and brass tubing. Hardened steel, chrome finished cone makes exceptionally smooth, high-strength flares with a radius at base of flare - instead of the sharp angle formed by ordinary tools. Slip-on yoke permits use in tight quarters, allows flaring where there is little space between nut and tube end. New feed screw design provides smooth, easier operation. Positive gripping and self-gauging of tube for exact flare size. Sliding die blocks lock in place by clamp action. Satin chrome and black finish. Wt. 1.75 lbs.

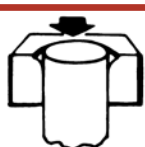
Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.032	.032	.032	.032	.035	.035



437-FB



FORMS STRONGER FLARES-
Stronger flares assured by smooth, even radius formed at base of every flare by engineered chamfer.



SELF GAUGING- Just insert tube flush with top of die for accurate flare size.

37° ROL-AIR™ FLARING TOOL

For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

507-FB For use with soft copper, aluminum and brass tubing. Faceted, hardened steel chrome finished cone rolls out perfect 37° flares above die block - then automatically burnishes flare face. Original wall thickness is maintained at base of flare. Slip-on yoke permits use in tight quarters where there is little space between nut and tube end. Larger handle, with better leverage, and precision threads on feed screw make flaring effortless. Heat treated dies firmly grip tubing. Satin chrome and black finish. Wt. 1.75 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.032	.032	.032	.032	.035	.035



507-FB



Flares rolled out above die bar by super-smooth faceted cone. Makes stronger, highly polished flares.

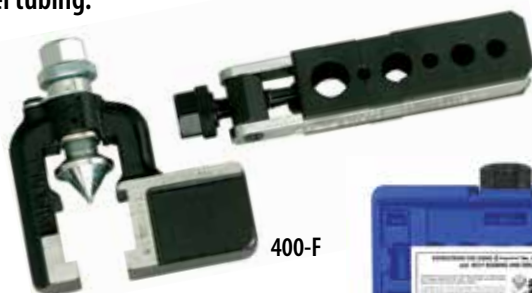
37° ROL-AIR™ FLARING TOOLS

For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. Steel and Stainless Steel tubing.

400-F Forms 37° flares to government specifications in steel, stainless steel (including MIL-T-6845), titanium and other metal tubing. Positive stop gauge assures correct size of flare. Special burnishing action polishes flare face. Three rollers in flaring cone roll out 37° flare above die block. Roller action cuts effort required; maintains original wall thickness - eliminates stress concentration. Extension on yoke for clamping in vise. Satin chrome and black finish. Includes tool case. Wt. 2.5 lbs.

401-FA Reaming yoke for 1/4" to 5/8" O.D. tubing. Recommended for use with steel and stainless steel tubing for proper flaring. Wt. 0.7 lbs.

402-FA Flaring and reaming kit. Contains No. 400-F Flaring Tool and No. 401-FA Reaming Yoke for 1/4" to 5/8" O.D. tubing. Includes tool case. Wt. 3.2 lbs. Conforms to Federal Specification GGG-F-451a. Type 1, Class 1, Style A.



400-F



402-FA



Feed release and burnishing mechanism. Flare control gauge.



3 rollers in flaring cone. Flare formed above die block.



401-FA

Feed screw controls depth of reaming.

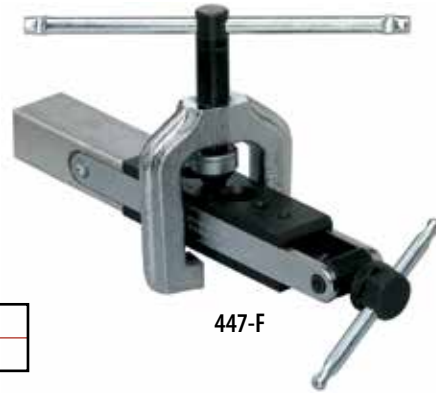
37° FLARING TOOLS

37° HEAVY-DUTY FLARING TOOL

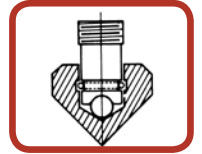
For 1/8", 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

447-F Forms 37° flares in annealed stainless steel (MIL-T-6345 or AMS5566), cold drawn stainless steel and annealed copper or aluminum tubing. Built to withstand continuous rugged service. Ball thrust bearing mechanism reduces effort required. Hardened tool steel die features non-slip grip of tubing, even after repetitive flaring. Bar has vise extension. Wt. 3.25 lbs.

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	1/2
Wall Thickness	(in.)	.032	.032	.035	.049	.049	.049



447-F



SWIVEL-TYPE BALL BEARING CONE - Ball thrust bearing in flaring cone minimizes friction, makes operation easier.

LARGE SIZE 37° ROL-AIR™ FLARING TOOLS

For 3/4", 7/8", 1", 1-1/4", 1-1/2" and 2" O.D. tubing.

Three cylinders in flaring cone roll out 37° flare above die block. Flares soft steel, copper, aluminum and fully annealed stainless steel tubing. Roller action reduces effort required; maintains original wall thickness; eliminates stress concentration. Feed release and burnishing action. Vise clamp extension on yoke. Heat treated dies clamp tubing without marking it. Satin chrome and black finish. Includes metal tool case.

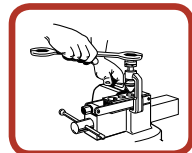
537-F Flares and burnishes 3/4", 7/8", 1" and 1-1/4" O.D. tubing. Wt. 13.0 lbs.

637-F Flares and burnishes 1-1/4", 1-1/2" and 2" O.D. tubing. Wt. 13.0 lbs.

* Conforms to Federal Specification GGG-F-451a, Type 1, Class 1, Style B.



537-F



Vise clamp extension.



Flares rolled out above die bar.



Feed release and burnishing mechanism.

Outside Tube Diameter	(in.)	3/4	7/8	1	1-1/4	1-1/2	2
Wall Thickness	(in.)	.065	.065	.065	.083	.083	.083

FLARING & SWAGING TOOLS

45° & 37° PRODUCTION FLARING AND SWAGING TOOL

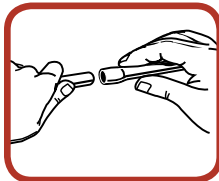
For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

555-FS Flares and swages 6 sizes of soft copper, aluminum or brass tubing. Makes both 45° and 37° single flares. Fast cam lever operation. Portable. Can be clamped in vise or bolted to bench. Change sizes quickly. Built in gauge for accurate flare size or swage depth. Unique jaws provide a positive non-slip grip on tubing. Wt. 6.5 lbs.

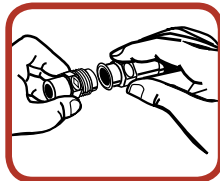
Replacement parts:

- 560-S-03** 3/16" Swaging adapter.
- 560-S-04** 1/4" Swaging adapter.
- 560-S-05** 5/16" Swaging adapter.
- 560-S-06** 3/8" Swaging adapter.
- 560-S-08** 1/2" Swaging adapter.
- 560-S-10** 5/8" Swaging adapter.
- S70348** 45° Flaring cone.
- S70349** 37° Flaring cone.
- S8711201** Set of replacement dies.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



Swages 6 sizes.



Makes 45° & 37° flares.



555-FS

METRIC BUBBLE FLARING TOOL

For soft steel or Bundy tubing 4.75 mm (3/16"), 6 mm, 8 mm and 10 mm O.D.

293-F Forms international standard bubble flare in one fast operation. Flares metric hydraulic brake lines used on European, Japanese and American automobiles and light trucks. This unique design makes flares on 4 sizes of tubing: 4.75 mm (3/16"), 6 mm, 8 mm and 10 mm O.D. Will flare soft double-wall steel tubing with a wall thickness up to .028". Can also be used with soft copper and aluminum tubing. Includes tool case.

Replacement parts:

- S8771801** 4.75 mm (3/16") adapter.
- S8771701** 6 mm adapter.
- S8771601** 8 mm adapter.
- S8771301** 10 mm adapter.
- S8694401** Wing nut.



293-F



METRIC BUBBLE FLARING -
Just insert tube flush with top of die for accurate flare. With proper adapter size attached, screw down flaring cone until adapter strikes flaring bar surface. Bubble flare is complete.

FLARING & SWAGING TOOLS

FLARING (45°) & SWAGING TOOL

For 1/8" to 3/4" O.D. tubing.

275-FS Flares and swages. Converts quickly. Screw-type feed. Ideal for use in close quarters. Two bars included cover 9 sizes. Swivel-type swaging adapters and flaring cone are hardened steel, chrome finished for easy operation. Self-centering, slip-on forged steel yoke. Includes tool case. Wt. 3.5 lbs. Flares 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. Includes 5 swage adapters for 7 tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8", 3/4" O.D.

Replacement parts: **278-FS-03X04X06** Adapter 3/16", 1/4", 3/8".
278-FS-05 Adapter 5/16".
278-FS-08 Adapter 1/2".

278-FS-10 Adapter 5/8".
278-FS-12 Adapter 3/4".
S38600 Flaring Cone.

275-FS



Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Wall Thickness	(in.)	.020	.028	.035	.035	.035	.035	.035	.035	.035



275-FS

45° FLARING, DOUBLE FLARING & SWAGING TOOL

For 1/8" to 3/4" O.D. tubing.

275-FSD Same as 275-FS with the addition of 5 double flaring adapters (3/16", 1/4", 5/16", 3/8", 1/2" O.D.).

45° FLARING, SWAGING AND CUTTING KIT

For soft copper, aluminum, steel, stainless steel and brass tubing.

275-FSC Kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and 275-FS 45° flaring and swaging tool. Includes tool case. Wt. 3.0 lbs.

Flares: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Swages: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

45° DOUBLE FLARING, SWAGING AND CUTTING KIT

275-FSCD Kit contains 275-FS, TC-1000, and double flaring adapters for 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Includes tool case.



275-FSC

FLARING & SWAGING TOOLS

175-EX XPANDR™ SWAGING/EXPANDING KIT

- Easily expands tube for braze or soldered joints in seconds.
- Floating jaw head design is self-centering for fast, accurate alignment.
- Re-rounds deformed tube ends.
- Accurate joints in seconds without using fittings.
- For soft copper and soft thin wall steel and stainless steel tubing.
- Save 60-70% of time over conventional swaging tools.
- Reduces soldering by 50% over standard fittings.
- Meets ARI tube insertion recommendations.
- Long life with high alloy hardened steel jaw segments.
- XpandR™ Tool comes with non-slip, ergonomically designed grips.
- Includes 5 heads: 3/8", 1/2", 5/8", 3/4" and 7/8".
- Includes metal tool case.

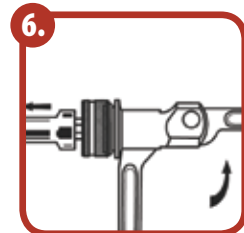
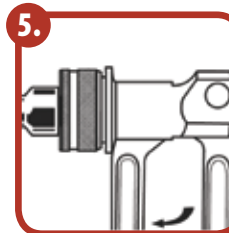
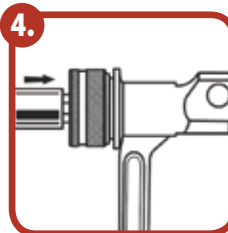
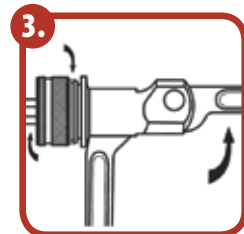
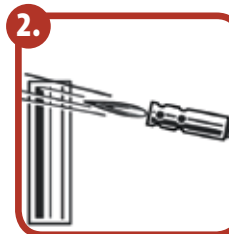


175-EX



SIX EASY STEPS:

1. Deburr inside of tube.
2. To create perfectly centered capillary sockets for soldering or brazing, you must use soft copper or fully anneal end of tube to be expanded.
3. Pull XpandR™ handle up to 90-degree position. Maintain this position as you screw the appropriate size head over the center-punch and tighten.
4. Insert the end of the tube over the XpandR™ head completely.
5. Pull the lever completely down.
6. Return the lever to the 90-degree position. Remove expanded tube.



175-EX KIT INCLUDES

175EXP	XpandR™ Pliers
175EXC	XpandR™ Case
175EX06	3/8" head
175EX08	1/2" head
175EX10	5/8" head
175EX12	3/4" head
175EX14	7/8" head

You may order kit items separately. Kit wt. 20 lbs.

ADDITIONAL HEAD SIZES AVAILABLE:

175EX16	1" head
175EX18	1-1/8" head
175EX22	1-3/8" head
175EX26	1-5/8" head

TO RE-ROUND SLIGHTLY DEFORMED TUBE ENDS:

1. Insert deformed tube end to the first groove of head.
2. Pull the lever completely down.
3. Return the lever to the 90-degree position. Remove expanded tube.

SWAGING TOOLS

PUNCH TYPE SWAGING TOOLS

Use these tools for making tubing connections without fittings. Enlarge end of tube, insert another tube of original O.D. size and solder together like a sweat fitting.

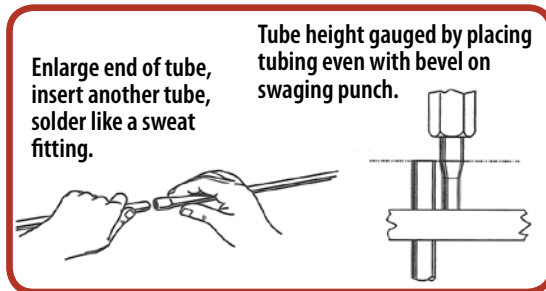
- 94-SSP** 3-in-1 swaging tool for 1/2", 5/8" and 7/8" tubing. Wt. 1.0 lbs.
- 95-S** 6-in-1 swaging tool for 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing. Hi-alloy steel, heat-treated for rugged use. Hex design for ease of extraction. Precision machined surface for ease of forming.
- 193-S** Vinyl case contains 4 swaging punches for 1/4", 3/8", 1/2" and 5/8" O.D. tubing. Wt. 1.0 lbs.
- 195-SA** Vise-mountable flaring bar and 4 swaging punches for 1/4", 3/8", 1/2" and 5/8" O.D. tubing. Includes metal tool case. Wt. 2.0 lbs.
- S75531** Flaring bar only. Wt. 1.0 lb.



94-SSP



193-S



195-SA

95-S 6 IN 1 SWAGING TOOL

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



95-S

INDIVIDUAL SWAGING TOOLS

PART NO.	TUBE O.D. (in.)	WALL THICKNESS (in.)	WEIGHT (lbs.)
93-S-04	1/4	.035	.20
93-S-05	5/16	.035	.25
93-S-06	3/8	.035	.25
93-S-08	1/2	.035	.50
93-S-10	5/8	.035	.50
93-S-12	3/4	.035	.75
93-S-14	7/8	.045	1.0

TUBE WORKING KITS

CUTTING AND FLARING KITS

Each kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and a 45° or 37° flaring tool. Includes tool case.

PART NO.	TUBE CUTTER	FLARING TOOL	RANGE OF FLARING TOOL (in.)	WEIGHT (lbs.)
120-F	TC-1000	375-FS (45°)	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4 O.D.	2.75
122-FA	TC-1000	437-FB (37°)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
123-FA	TC-1000	300-FB (45°)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
124-FA	TC-1000	500-FC (45° Rol-Air™)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
1226-FA	TC-1000	195-FC (45°)	3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8 O.D.	3.0



124-FA



120-F



1226-FA

TUBE WORKING KITS

45° FLARING, SWAGING AND CUTTING KIT

For soft copper, aluminum, steel, stainless steel and brass tubing.

275-FSC Kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and 275-FS 45° flaring and swaging tool. Includes tool case. Wt. 3.0 lbs.

Flares: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Swages: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

45° DOUBLE FLARING, SWAGING AND CUTTING KIT

275-FSD Kit contains 275-FS, TC-1000, and double flaring adapters for 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Includes tool case.



275-FSC

FLAREPRO™ FOUR-IN-ONE FLARING & SWAGING KIT

For copper, aluminum, steel, stainless steel and other metal tubing.

2000-FS Individual size jaw sets are used for positive clamping compactness and operating convenience.

Socket head screws are provided for clamping the jaws to the yoke and feeding the tube forming components. The screws are hand turned for all free travel movement when advancing or retracting.

A hex socket and 3/8" square drive ratchet are furnished for easy operation of the threaded members under load. Tube forming components (flaring cones, double flaring adapters and swaging adapters) are retained on the feed screw by a ball detent mechanism and can be snapped on and off for quick change as required.

The tool is designed to permit hand-held or vise-mounted operation. Includes tool case. Wt. 7.0 lbs.

Flaring - 37° and 45°: Flares soft copper, brass, aluminum, steel and stainless steel in nine tube sizes: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Double Flaring - 45° Only: Double flares soft copper, aluminum and steel (Bundy or G.M. to .035 wall) in seven tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

Swaging: Swages soft copper, aluminum and brass in seven tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.



2000-FS

Flaring

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Wall Thickness	(in.)	.020	.028	.035	.035	.035	.035	.035	.049	.049

Swaging

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8	3/4
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035	.035

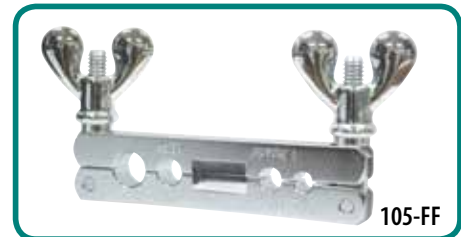
TESTING AND SERVICE TOOLS

PINCH-OFF TOOL

For 1/4" to 1/2" O.D. tubing.

Temporarily closes soft copper, aluminum or steel tubing so no liquid or gas passes sealed part. Lets you disconnect line while making repairs without loss of liquid or gas. Forming holes for 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

105-FF Pinch-Off Tool for 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Wt. .75 lbs.



TUBING TEST PLUGS

For 1/4" to 1-3/8" O.D. tubing.

For temporary shut-off of tubing without pinching it off or installing a valve. Especially handy for plumbing, heating, refrigeration and instrumentation when troubleshooting for leaks. Lightweight, fast acting, dependable. Insert plug in tube end and tighten wing nut. Expander seals tube and holds pressures to 100 PSI.

142-F 3-Pc. test plug kit for 1/2", 5/8" and 7/8" O.D. tubing. Wt. .5 lbs.



140-F-06

INDIVIDUAL TEST PLUGS

PART NO.	TUBE O.D. (in.)	MIN I.D. DIA. (in.)	MAX I.D. DIA. (in.)	WEIGHT EACH (oz.)	REPLACEMENT SLEEVE
140-F-04	1/4	.171	.190	.5	S62641
140-F-06	3/8	.265	.315	.75	S62648
140-F-08	1/2	.390	.436	1.0	S62655
140-F-10	5/8	.515	.545	1.5	S62661
140-F-12	3/4	.640	.745	2.0	S62666
140-F-14	7/8	.734	.995	3.0	S66434
140-F-18	1-1/8	.984	1.245	4.0	S66435
140-F-22	1-3/8	1.218	1.270	4.0	S71174



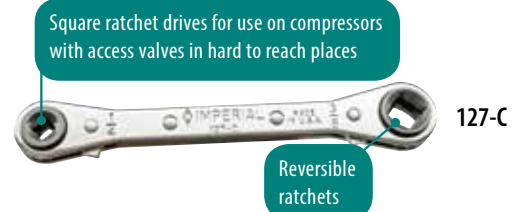
142-F

WRENCHES

WRENCHES

For Refrigeration and Air Conditioning Service.

127-C Compressor access valve wrench. Chrome plated. Has 1/4", 3/8", 3/16" and 5/16" square drive ratchets and is specially designed for use on compressors with access valves in hard to reach places. Reversible ratchets.



127-C

127-C0 Same as 127-C except with unique 25° offset that provides additional convenience in hard to reach places.



127-C0

124-C Combination wrench with the four sizes most needed for servicing air-conditioning and refrigerator equipment:

- 9/16" hex for dust cap on access valves and plug oil check on compressor.
- 1/2" hex for compressor mounting bolts.
- 1/4" square for valve stem and service valves and old style compressor valves.
- 3/16" square for valve refrigerant charging tanks.



124-C

126-C Economy compressor access valve wrench. Chrome plated. Has 1/4", 3/8", 3/16" and 5/16" square drive ratchets and is specially designed for use on compressors with access valves in hard to reach places. Reversible ratchets.



126-C

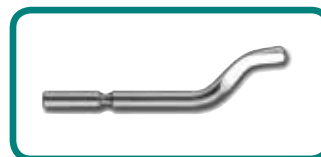
TUBE DEBURRING

DEBURRING TOOL

210-F The rotary style blade is perfect for removing burrs from holes and edges. Large ergonomic handle reduces user fatigue. Ships complete with two heavy duty blades - extra blade stores inside the handle. For copper, steel, aluminum, zinc, cast iron, brass and plastic tubing. Length 5-3/4". Wt. 1.5 oz.



210-F



S10001087 -Deburrr Replacement Blade

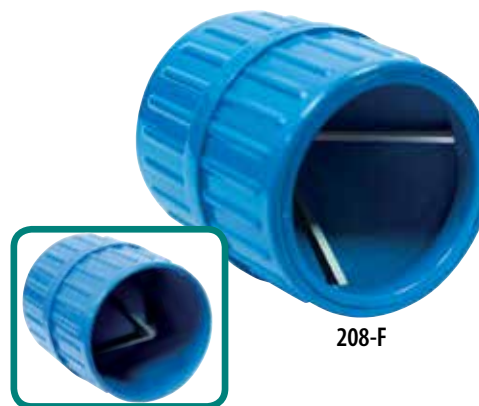
INNER-OUTER REAMING AND DEBURRING TOOLS

For 3/16" to 1-1/2" (5 mm to 38 mm) O.D. tubing.

Reams both inside and outside edges of tube at a 60° included angle with 3 hardened cutting blades. Tough die cast body. Deburs both clockwise and counterclockwise. Fluted body is shaped to fit comfortably in palm.

208-F Reamer for copper, aluminum and brass tubing. Hardened steel cutter blades. Blue finish. Wt. .63 lbs.

208-FSS Reamer for aircraft grade stainless steel tubing, hard or soft copper, aluminum, brass and steel tubing. Tungsten hardened tool steel cutter blades. Black finish. Wt. .63 lbs.



208-F

IMPERIAL® TOOL BAG

15-POCKET PROFESSIONAL TOOL BAG

TB-52 Tool Bag

- 8"W x 16"L x 11"D.
- Double layered ballistic nylon.
- Wide opening mouth.
- Padded handles and 48" shoulder strap.
- Designed to hold tools.
- Tools not included!



TB-52

RATCHET WRENCHES

195-F KWIK-TITE® RATCHET WRENCHES

For 5/16" to 2" and 7 mm to 32 mm hex sizes.

The Kwik-Tite ratchet wrench speeds installation of tube fittings and valves, hex nuts, bolts and fasteners. This unique wrench, with its open jaw design, makes it easy to slip onto fittings and fasteners, even in tight quarters. Flips quickly into tightening position with a sure grip on all hex surfaces.

12-point contact distributes torque pressures evenly on the flats of the hex, not at the corners. Eliminates warping and distorting of fittings and fasteners. Because of the Kwik-Tite ratchet action, tightening jobs are easier and faster.

Kwik-Tite wrenches are constructed for rugged use. Jaws are hardened steel. Handles are made of heavy gauge alloy steel, with a black oxide finish.

SAE

PART NO.	HEX SIZE (in.)	OVERALL LENGTH (in.)
195-F 05	5/16	5-1/2
195-F 06	3/8	5-1/2
195-F 07	7/16	5-3/8
195-F 08	1/2	5-1/2
195-F 09	9/16	7-1/4
195-F 10	5/8	7-5/32
195-F 11	11/16	7-1/4
195-F 12	3/4	7-5/16
195-F 13	13/16	9-1/8
195-F 14	7/8	9-3/32
195-F 15	15/16	9-1/4
195-F 16	1	9-9/32
195-F 17	1-1/16	13.59
195-F 18	1-1/8	13.59
195-F 19	1-3/16	13.59
195-F 20	1-1/4	13.59
195-F 22	1-3/8	13.84
195-F 24	1-1/2	13.84
195-F 26	1-5/8	13.84
195-F 28	1-3/4	14.21
195-F 32	2	14.21

(1) 5/16" - 3/4" sizes have two-tone grips as shown.

(2) 13/16" - 1" sizes do not have grips.

(3) 1-1/16" - 2" sizes have foam grips (not shown).



Ratcheting of wrench requires only 30° of movement.



195-F 12



195-F 22 mm



METRIC

PART NO.	HEX SIZE (mm)	OVERALL LENGTH (mm)	OVERALL LENGTH (in.)
195-F 07 mm	7	140.72	5.54
195-F 08 mm	8	140.72	5.54
195-F 09 mm	9	140.72	5.54
195-F 10 mm	10	140.72	5.54
195-F 11 mm	11	140.72	5.54
195-F 12 mm	12	140.72	5.54
195-F 13 mm	13	140.72	5.54
195-F 14 mm	14	187.45	7.38
195-F 15 mm	15	187.45	7.38
195-F 16 mm	16	187.45	7.38
195-F 17 mm	17	187.45	7.38
195-F 18 mm	18	187.45	7.38
195-F 19 mm	19	187.45	7.38
195-F 21 mm	21	237.50	9.35
195-F 22 mm	22	237.50	9.35
195-F 24 mm	24	237.50	9.35
195-F 27 mm	27	345.19	13.59
195-F 30 mm	30	345.19	13.59
195-F 32 mm	32	345.19	13.59

(1) 7 mm - 19 mm sizes have two-tone grips as shown.

(2) 21 mm - 24 mm sizes do not have grips.

(3) 27 mm - 32 mm sizes have foam grips (not shown).



195-5STD KIT



195-7STD KIT

KWIK-TITE® RATCHET WRENCH KITS

PART NO.	DESCRIPTION	WEIGHT (lbs.)
195-4STD KIT	4-Pc. SAE kit for refrigeration. Contains 5/8", 13/16", 15/16", and 1-1/16" wrenches in pouch. (Not shown).	2.3
195-5STD KIT	5-Pc. metric kit. Contains 10 mm, 11 mm, 12 mm, 13 mm and 14 mm wrenches in pouch.	2
195-7STD KIT	7-Pc. SAE kit. Contains 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4" wrenches in pouch.	2.5

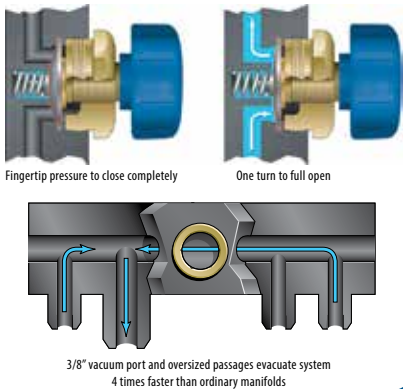
SERVICE MANIFOLDS

600 SERIES 4-VALVE MANIFOLD

- **4-Valve Efficiency** - Vacuum, low side, high side, and refrigerant lines are individually connected and controlled. No need to switch charging lines.
- **4 Times Faster Evacuation** - 3/8" vacuum port and oversize internal passages evacuate systems four times faster than ordinary manifolds. 3/8" port has greater area than combined inlets of high and low side lines.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

See Manifolds Reference Guide on pages 30-32 for complete list of available configurations.

DIAPHRAGM TYPE SOFT SEAT VALVES



800 SERIES DEEP DRAW 4-VALVE MANIFOLD

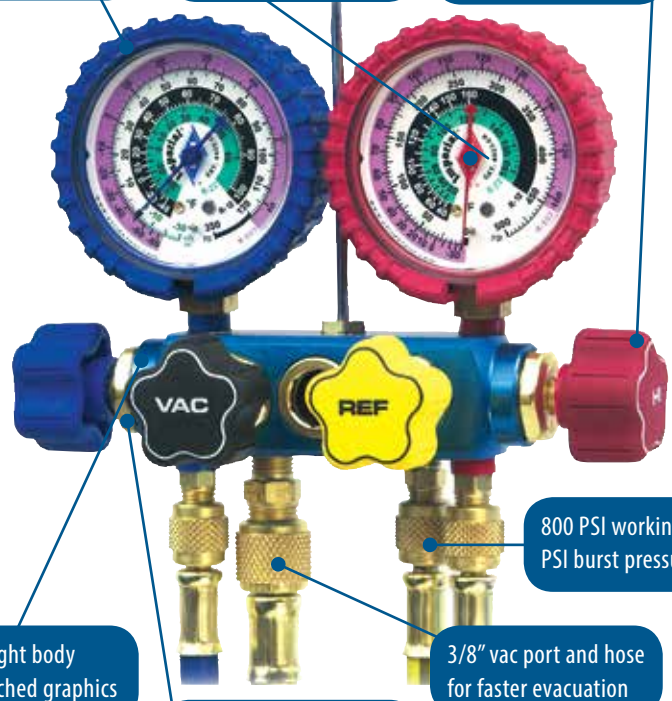
To keep on air-conditioning system moisture and contaminant-free, today's modern refrigerants, such as R-410A, require the technician to pull a low vacuum and hold it for longer periods of time when performing evacuations. The 800 series manifold, with its proprietary new design, is guaranteed to bounce back and maintain its peak efficiency at extreme operating pressures.

- **Unique Deep Draw Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.

Gauge boots are standard on 4-valve manifolds

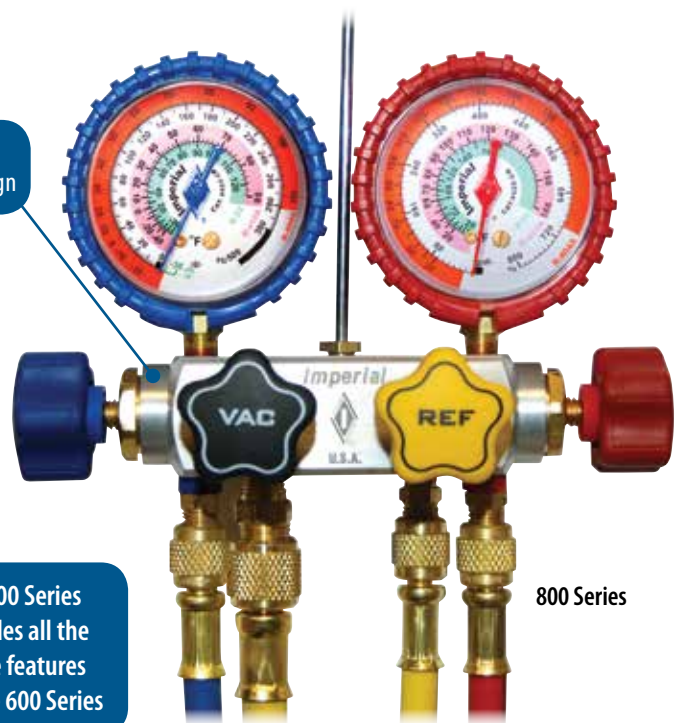
Non-flutter gauges with high-visibility faceplate

Larger knobs with soft-touch grip surface



600 Series

Proprietary new diaphragm design



800 Series

SERVICE MANIFOLDS

700 SERIES KWIK-CHARGER™ MANIFOLD

Charging the system is faster and easier than ever using Imperial® manifolds with built-in liquid low side charger.

- **Dual Action Valve** - Operates as a conventional manifold, or engage the special control valve and the manifold accepts liquid refrigerant from cylinder and discharges into the low side of the system. Charging rate is up to eight times faster than vapor charging.
- **Safe** - Internal metering element reduces liquid flow to a level below capacity of the compressor. Assures a safe, fast charge without endangering the compressor.
- **All-In-One** - No connecting or disconnecting special adapters for charging new blended refrigerants.
- **No Pressure Drop-In Cylinder** - No need to heat refrigerant cylinder.
- **Works With All Refrigerants** - CFC, HFC, HCFC, Zeotropic and Azeotropic.
- **Filters In All Manifold Port Fittings** - To keep out particulate material that may be present during recovery or reclaim or in recovered refrigerant. Filters are easily serviceable.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique gauges provide superior resistance to shock, vibration & pulsation for accurate performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

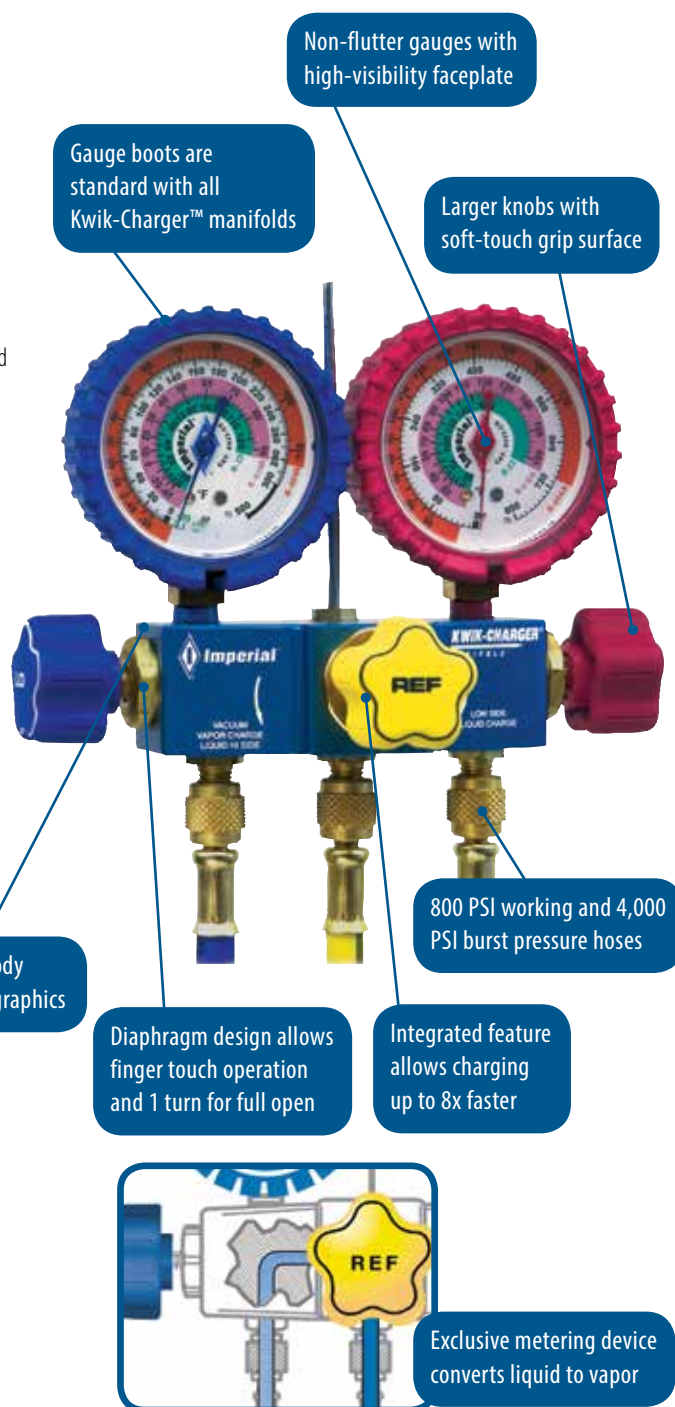
See Manifolds Reference Guide on pages 30-32 for complete list of available configurations.

Rugged lightweight body features laser-etched graphics

Diaphragm design allows finger touch operation and 1 turn for full open


Integrated feature allows charging up to 8x faster

Exclusive metering device converts liquid to vapor

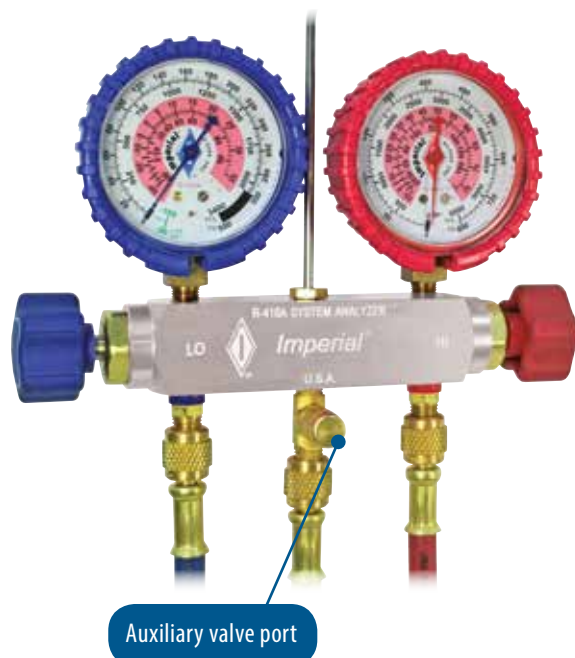


SERVICE MANIFOLDS


510 SERIES 2-VALVE / 4-PORT R-410A MANIFOLDS

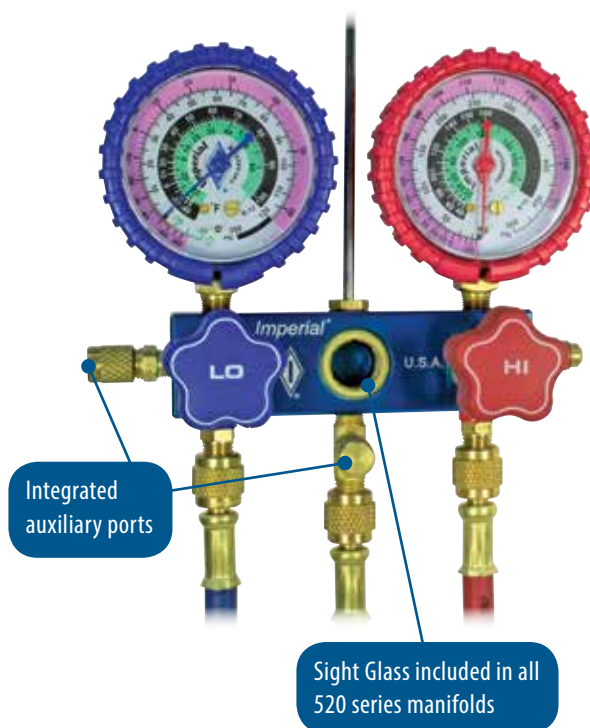
- **Auxiliary Valve Port** - Allows multiple hookups for vacuum gauge, vacuum pump, recovery unit and add-ons.
- **Dual O-Ring Seal** - For high-pressure valve use. Electroless nickel plate stem to reduce wear and gauling.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration & pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses**  - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

See Manifolds Reference Guide on pages 30-32 for complete list of available configurations.



520 SERIES 2-VALVE / 4- OR 5-PORT MANIFOLDS

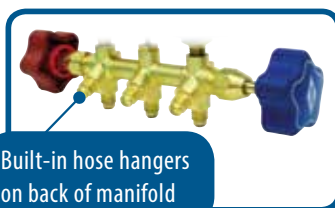
- **Two Integrated Auxiliary Ports** - Provide additional hookups for use with a micron (vacuum) gauge, vacuum pump, adding tracer dye, adding oil, purging non-condensables.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **PolarShield® Hi-Performance Hoses**  - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Swivel Hanger**



SERVICE MANIFOLDS

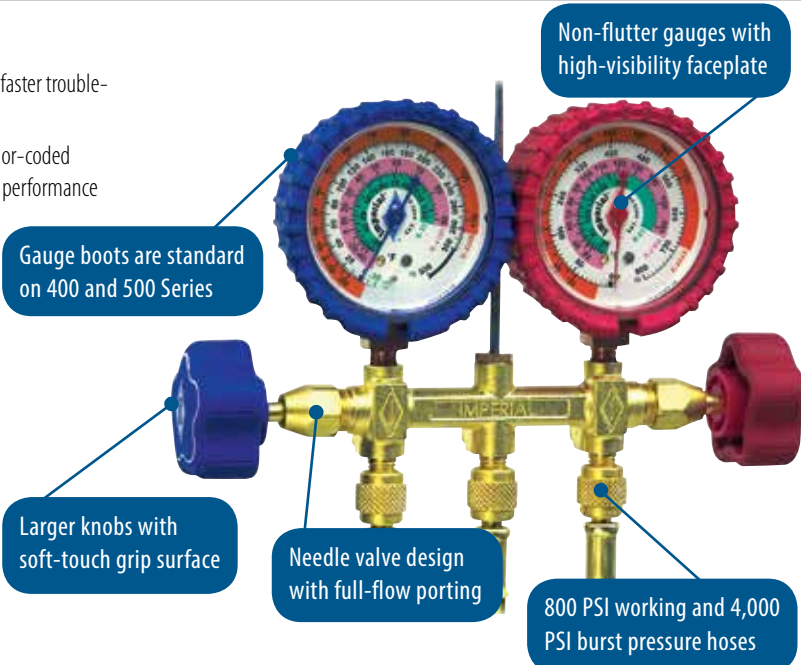
400 SERIES DELUXE 2-VALVE BRASS MANIFOLD

- **Dual O-Ring Valves** - Precision engineered with dynamic full-flow design for faster trouble-free evacuation and charging.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **Soft-Seat Valves** - Seat tightly with fingertip pressure.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**



Built-in hose hangers on back of manifold

See Manifolds Reference Guide on pages 30-32 for complete list of available configurations.



Non-flutter gauges with high-visibility faceplate

Gauge boots are standard on 400 and 500 Series

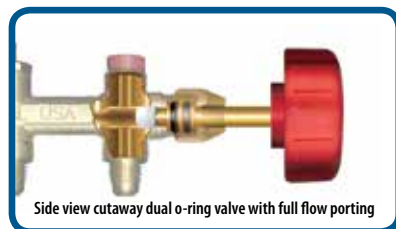
Larger knobs with soft-touch grip surface

Needle valve design with full-flow porting

800 PSI working and 4,000 PSI burst pressure hoses

300 SERIES ECONOMY BRASS MANIFOLDS

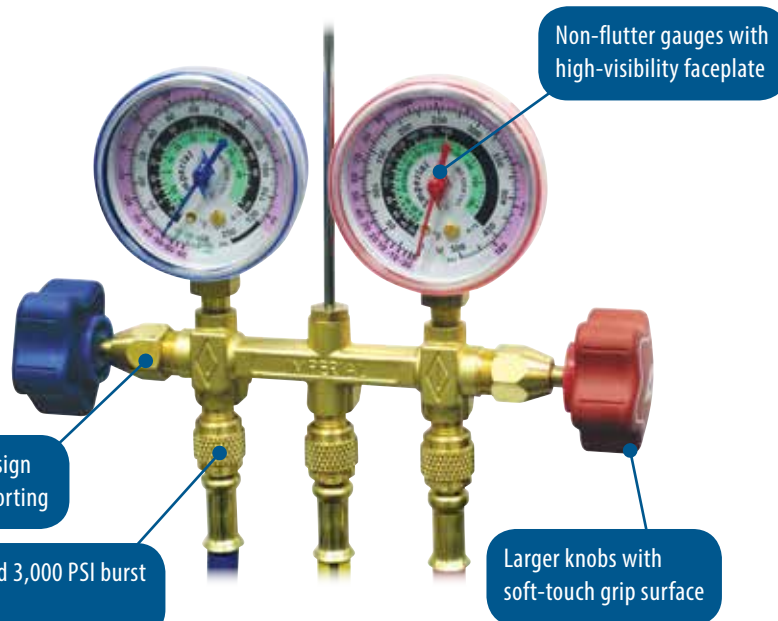
- **Soft Seat Valve** - Brass stem with long wearing soft tip seats tightly, with fingertip pressure.
- **Precision Gauges** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration & pulsation for superior performance and extended gauge life.
- **Premium Hose** - 600 PSI working pressure, 3,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Dual O-Ring Seal Valves**
- **Swivel Hanger**



Side view cutaway dual o-ring valve with full flow porting

Needle valve design with full-flow porting

600 PSI working and 3,000 PSI burst pressure hose



Non-flutter gauges with high-visibility faceplate

Larger knobs with soft-touch grip surface

SINGLE GAUGE CHARGING AND TESTING UNIT

A compact, single gauge unit which will perform a variety of charging and testing operations. Body is forged brass, with 1/4" SAE port flare connections.

- **Soft-Seat Valve** - Brass stem with long wearing soft tip seats tightly, with fingertip pressure.
- **Ergonomic Handle** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

466-C Charging and Testing Unit with 425-CB, 2-1/2" compound gauge. 0 -30" vacuum, 0-120 lbs. pressure.



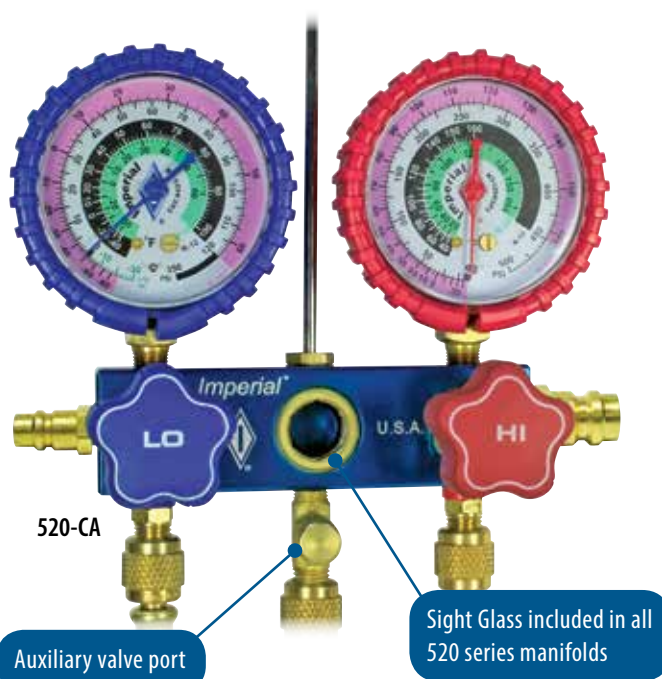
466-C

AUTOMOTIVE SERVICE MANIFOLDS & ACCESSORIES

520 SERIES 2-VALVE 4-PORT SERVICE MANIFOLDS

- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

See Manifolds Reference Guide on pages 30-32 for complete list of available configurations.



AUTOMOTIVE HIGH SIDE 1/4" CONVERSION ADAPTER

- 20-A** High side adapter. Converts 3/16" system access valve to 1/4" access valve for use with standard 1/4" charging hose.

20-A



PREMIUM R-134a HI-FLOW AUTO SERVICE COUPLERS

14 mm thread connection. Quick connect/disconnect valve actuation eliminates venting. Color-coded knobs for high/low connections.

- Integral safety sleeve prevents accidental refrigerant venting under all operating conditions.
- Provides maximum flow without damaging service port.
- Meets current SAE-J639 specifications.

- 21-L** Low side service coupler.
21-H High side service coupler.

21-L



21-H



SERVICE MANIFOLDS REFERENCE GUIDE

PART NO.	REFRIGERANT	GAUGE CALIBRATION**					TEMP		CHARGING LINES (BV = Low Loss Ball Valve Shut-Off)	MANIFOLD PORT CONNECTIONS
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C		
600 SERIES 4-VALVE MANIFOLD (CONT.)										
R-12, R-22, R-502										
621-CD*	R-12, R-22, R-502	●		●			●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CK*	R-12, R-22, R-502				●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CKP*	R-12, R-22, R-502	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CM*	R-12, R-22, R-502			●				●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CS* (w/Sight Glass)	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
629-C*	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-22, R-407C, R-410A										
626-CSC †	R-22, R-407C, R-410A	●						●	6-36" (B, R, Y 1/4" x 1/4"; B, R 1/4" x 5/16"; 3/8" VAC)	1/4" & 3/8" SAE
R-134a										
630-CKP*	R-134a	●			●		●	●		1/4" & 3/8" SAE
630-CKPS* (w/Sight Glass)	R-134a	●			●		●	●		1/4" & 3/8" SAE
631-CKP*	R-134a	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
631-CKP-6	R-134a	●			●		●	●	4-72" (3/8" VAC)	1/4" & 3/8" SAE
631-CKPS* (w/Sight Glass)	R-134a	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
R-410A										
640-C*	R-410A	●			●		●	●		1/4" & 3/8" SAE
640-CB	R-410A	●	●					●		1/4" & 3/8" SAE
641-CC †	R-410A	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
641-CM	R-410A	●			●		●	●	4-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4"; 3/8" VAC)	1/4" & 3/8" SAE
642-C*	R-410A	●			●		●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-410A, R-22, R-404A										
644-C*	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
644-CS* (w/Sight Glass)	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
645-C*	R-410A, R-22, R-404A	●					●			1/4" & 3/8" SAE
646-C*	R-410A, R-22, R-404A	●					●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-404A, R-407C, R-134a										
660-CB	R-404A, R-407C, R-134a	●	●					●		1/4" & 3/8" SAE
R-404A, R-507, R-134a										
650-C*	R-404A, R-507, R-134a	●					●			1/4" & 3/8" SAE
651-C*	R-404A, R-507, R-134a	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
651-CKPSC † (w/Sight Glass)	R-404A, R-507, R-134a			●	●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
652-C*	R-404A, R-507, R-134a	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-22, R-134a, R-404A										
680-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●		1/4" & 3/8" SAE
681-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
520 SERIES 2-VALVE 4- OR 5-PORT MANIFOLD										
R-134a, R-12										
520-CA* (w/Sight Glass)	R-134a, R-12	●					●			1/4" SAE
520-CAM (w/Sight Glass)	R-134a, R-12			●	●			●		1/4" SAE
R-12, R-22, R-502										
520-C* (w/Sight Glass)	R-12, R-22, R-502	●					●			1/4" SAE
521-C (w/Sight Glass)	R-12, R-22, R-502				●		●		3-60"	1/4" SAE
523-C (w/Sight Glass)	R-12, R-22, R-502	●					●		3-36"	1/4" SAE
R-404A, R-407C, R-134a										
560-CB (w/Sight Glass)	R-404A, R-407C, R-134a	●	●					●		1/4" SAE
R-22, R-407C, R-410A										
566-CC †	R-22, R-407C, R-410A	●						●	5-36" (B, R, Y 1/4" x 1/4"; B, R 1/4" x 5/16")	1/4" SAE
R-404A, R-507, R-134a										
525-CKPC † (w/Sight Glass)	R-404A, R-507, R-134a			●	●			●	3-36"	1/4" SAE
R-22, R-134a, R-404A										
580-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●		1/4" SAE
581-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●	3-60"	1/4" SAE
510 SERIES 2-VALVE 4-PORT MANIFOLD										
R-32, R-410A										
516-CC	R-32, R-410A	●			●			●	3-36" (5/16" x 5/16")	5/16" SAE
R-410A										
510-C*	R-410A	●			●		●	●		1/4" SAE
510-CM*	R-410A					●		●		1/4" SAE
511-C*	R-410A	●			●		●	●	3-60"	1/4" SAE
511-CM*	R-410A					●		●	3-60"	1/4" SAE
512-C*	R-410A	●			●		●	●	3-60" w/BV	1/4" SAE
513-C*	R-410A	●			●		●	●		5/16" SAE
514-CC †	R-410A	●			●		●	●	3-36" (5/16" x 5/16")	5/16" SAE
515-C*	R-410A	●			●		●	●	3-60" (5/16" x 5/16")	5/16" SAE
522-CC †	R-410A	●			●		●	●	3-60" (B, R 1/4" x 5/16" w/BV; Y 1/4" x 1/4")	1/4" SAE
540-CB	R-410A	●	●					●		1/4" SAE
570-CKPC † (w/Sight Glass)	R-410A	●			●		●	●		5/16" SAE
572-CKPC † (w/Sight Glass)	R-410A	●			●		●	●	3-60" (5/16" x 5/16")	5/16" SAE
R-410A, R-22, R-407C										
582-CKPC † (w/Sight Glass)	R-410A, R-22, R-407C	●			●			●	3-36" (1/4" x 5/16")	1/4" SAE

* Add "C" suffix for clamshell packaging. † Clamshell packaging only. **All gauges available with MPa, kPa, Bar, etc.

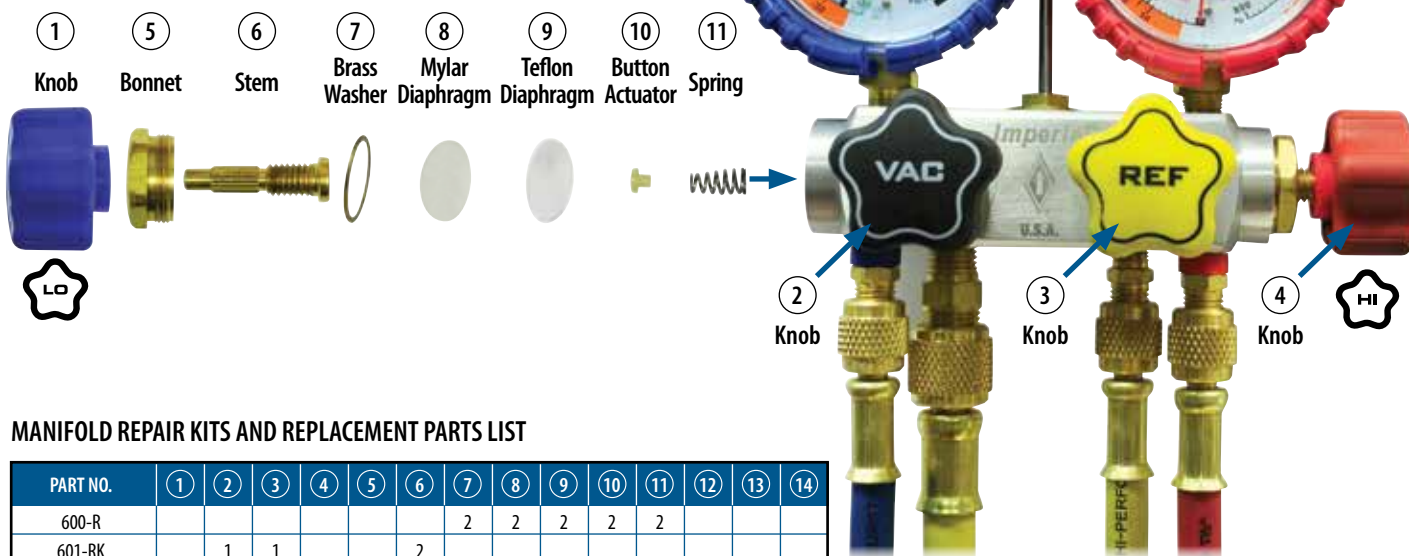
SERVICE MANIFOLDS REFERENCE GUIDE

PART NO.	REFRIGERANT	GAUGE CALIBRATION**					TEMP		CHARGING LINES (BV = Low Loss Ball Valve Shut-Off)	MANIFOLD PORT CONNECTIONS
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C		
400 & 500 SERIES DELUXE 2-VALVE BRASS MANIFOLD										
R-410A										
415-C*	R-410A	●			●		●	●		1/4"SAE
416-C*	R-410A	●			●		●	●	3-36"	1/4"SAE
417-C*	R-410A	●			●		●	●	3-60"	1/4"SAE
417-C-6	R-410A	●			●		●	●	3-72"	1/4"SAE
418-CC †	R-410A	●			●		●	●	3-60" w/BV	1/4"SAE
419-C	R-410A	●			●		●	●	2-36" w/BV (B, R 1/4" x 5/16"); 1-60" / BV (Y 1/4" x 1/4")	1/4"SAE
454-C	R-410A	●			●		●	●	3-36" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4"SAE
455-C	R-410A	●			●		●	●	3-36" w/BV (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4"SAE
456-C	R-410A	●			●				3-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4"SAE
R-410A, R-22, R-404A										
420-C*	R-410A, R-22, R-404A	●					●			1/4"SAE
421-C*	R-410A, R-22, R-404A	●					●		3-60"	1/4"SAE
421-CM	R-410A, R-22, R-404A	●					●		3-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4"SAE
422-C*	R-410A, R-22, R-404A	●					●		3-60" w/BV	1/4"SAE
R-134a										
435-CKP	R-134a	●			●		●	●		1/4"SAE
436-CKP*	R-134a	●					●	●	3-36"	1/4"SAE
R-22, R-134a, R-404A										
443-C	R-22, R-134a, R-404A	●					●		3-60"	1/4"SAE
R-404A, R-507, 134a										
450-C*	R-404A, R-507, R-134a	●					●			1/4"SAE
450-CM	R-404A, R-507, R-134a			●	●			●		1/4"SAE
451-C*	R-404A, R-507, R-134a	●					●		3-36"	1/4"SAE
451-CM*	R-404A, R-507, R-134a			●	●			●	3-36"	1/4"SAE
452-C*	R-404A, R-507, R-134a	●					●		3-60"	1/4"SAE
452-C-6	R-404A, R-507, R-134a	●					●		3-72"	1/4"SAE
R-12, R-22, R-502										
494-C	Manifold body only									1/4"SAE
495-C*	R-12, R-22, R-502	●					●			1/4"SAE
495-CB	R-12, R-22, R-502	●	●					●		1/4"SAE
495-CD*	R-12, R-22, R-502	●		●			●			1/4"SAE
495-CKP*	R-12, R-22, R-502	●			●			●		1/4"SAE
496-C*	R-12, R-22, R-502	●					●		3-36"	1/4"SAE
496-CD*	R-12, R-22, R-502	●		●			●		3-36"	1/4"SAE
496-CKP*	R-12, R-22, R-502	●			●			●	3-36"	1/4"SAE
498-C*	R-12, R-22, R-502	●					●		2-36" (B, R), 1-60" (Y)	1/4"SAE
500-C*	R-12, R-22, R-502	●					●		3-60"	1/4"SAE
500-CD*	R-12, R-22, R-502	●		●			●		3-60"	1/4"SAE
500-CD-6	R-12, R-22, R-502	●		●			●		3-72"	1/4"SAE
505-C	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings	1/4"SAE
R-22, R-134a, R-404A										
481-CKPC †	R-22, R-134a, R-404A	●			●			●		1/4"SAE
482-CKP*	R-22, R-134a, R-404A	●			●			●	3-36"	1/4"SAE
R-32, R-410A										
453-C	R-32, R-410A	●			●		●		3-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4"SAE
300 SERIES ECONOMY 2-VALVE BRASS MANIFOLD										
R-134a										
335-CKP*	R-134a	●			●		●	●		1/4"SAE
336-CKP*	R-134a	●			●		●	●	3-36"	1/4"SAE
R-12, R-22, R-502										
395-C*	R-12, R-22, R-502	●					●			1/4"SAE
395-CD*	R-12, R-22, R-502	●		●			●			1/4"SAE
395-CKP*	R-12, R-22, R-502	●			●			●		1/4"SAE
396-C*	R-12, R-22, R-502	●					●		3-36"	1/4"SAE
396-CD*	R-12, R-22, R-502	●		●			●		3-36"	1/4"SAE
396-CKP	R-12, R-22, R-502	●			●			●	3-36"	1/4"SAE
397-CD	R-12, R-22, R-502	●		●			●		3-72"	1/4"SAE
398-CC †	R-12, R-22, R-502	●					●		3-60"	1/4"SAE
398-CD	R-12, R-22, R-502	●		●			●		3-60"	1/4"SAE
R-22, R-134a, R-404A										
398-CKP*	R-22, R-134a, R-404A	●			●			●	3-36"	1/4"SAE
MANIFOLD ACCESSORIES & SERVICE PARTS (see pages 33-34 for details)										
10SG	Sight Glass Repair Kit									
400-RB	Set: Red & Blue Protective Gauge Boots									
405-RH	High Side Repair Kit w/soft touch knob for 300 & 400 Series "Imperial USA" brass manifold									
405-RL	Low Side Repair Kit w/soft touch knob for 300 & 400 Series "Imperial USA" brass manifold									
500-RH	High Side Repair Kit for 510 & 511 Series R-410A manifold									
500-RL	Low Side Repair Kit for 510 & 511 Series R-410A manifold									
600-R	Diaphragm Replacement Seal Kit for all 600 Series manifolds									
601-RK	Replacement VAC & REF Knobs w/stems for all 600 Series manifolds									
602-RK	Replacement HI & LO Knobs w/stems for all 600 Series manifolds									
700-CV	Control Valve Repair Kit for 700 Series manifold									
800-R	Repair Kit for 800 Series manifold									

* Add "C" suffix for clamshell packaging. † Clamshell packaging only. ** All gauges available with MPa, kPa, Bar, etc.

SERVICE MANIFOLDS PARTS ILLUSTRATIONS

800 AND 600 SERIES 4-VALVE MANIFOLD



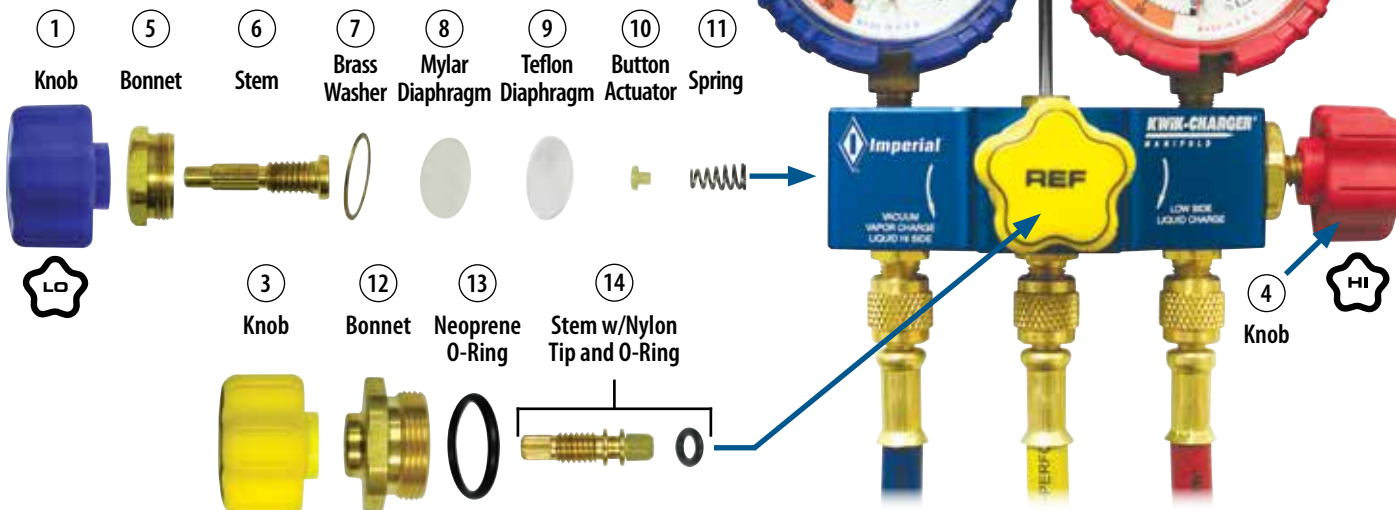
MANIFOLD REPAIR KITS AND REPLACEMENT PARTS LIST

PART NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
600-R							2	2	2	2	2			
601-RK		1	1			2								
602-RK	1			1		2								
700-CV †			1									1	1	1
800-R *	1	1	1	1		4	4	4	4	4	4			
S64104									10					
S64108							10							
S64870										10	10			
S69021								10						
S76548					2									

* 800-R repair kit also contains (4) pcs Stainless Steel Washer (Not Shown).

† 700-CV is shipped completely assembled for quick & easy replacement.

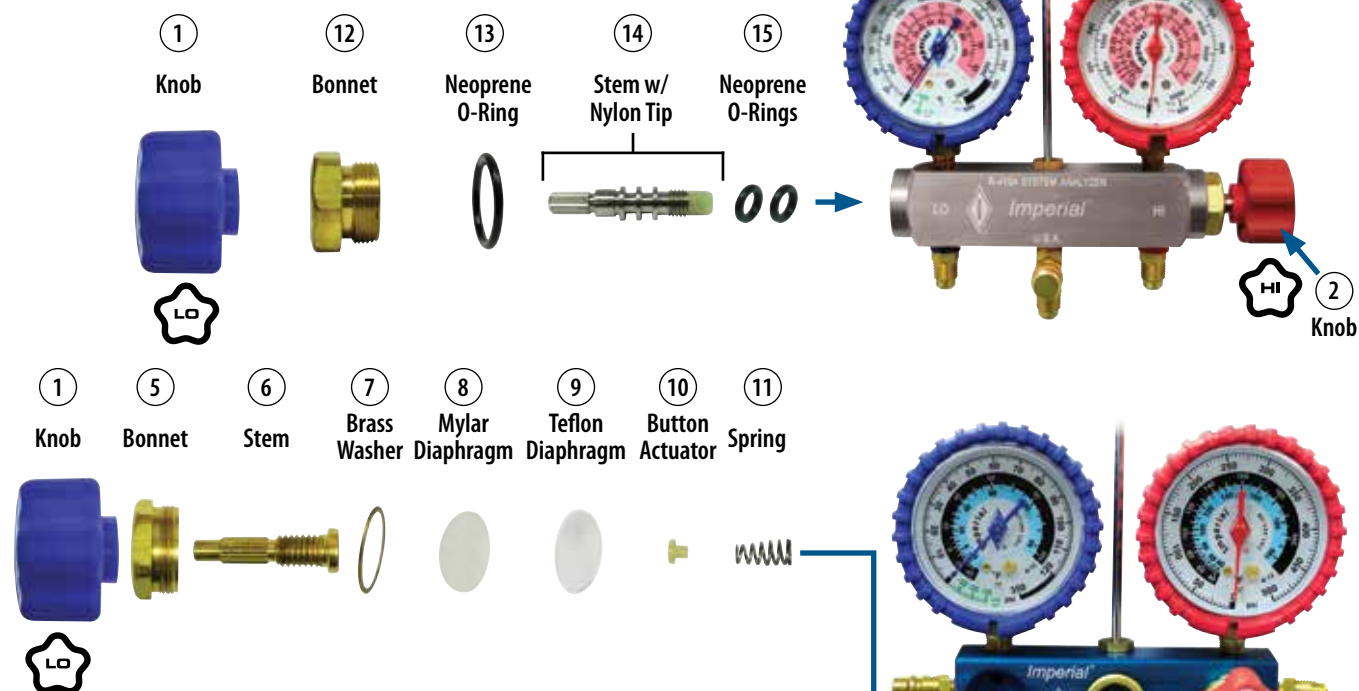
700 SERIES KWIK-CHARGER™ MANIFOLD



† 700-CV is shipped completely assembled for quick & easy replacement.

SERVICE MANIFOLDS

510 AND 520 SERIES 2-VALVE MANIFOLD

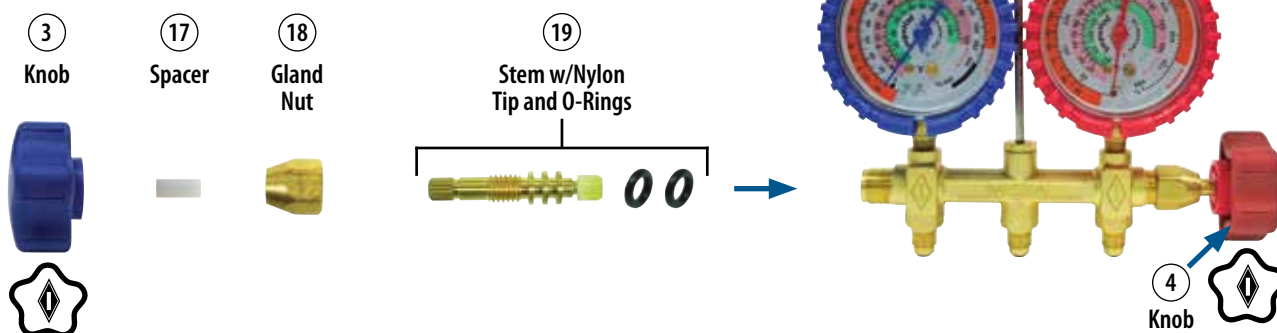


MANIFOLD REPAIR KITS AND REPLACEMENT PARTS LIST

PART NO.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	⑱
10SG																1		
405-RH *				1													1	1
405-RL *			1														1	1
500-RH *		1										1	1	1	2			
500-RL *	1											1	1	1	2			
600-R							2	2	2	2	2							
602-RK	1	1				2												
S64104										10								
S64108							10											
S64870											10	10						
S69021								10										
S76548					2													

* These kits are shipped completely assembled for quick & easy replacement.

400 AND 300 SERIES 2-VALVE BRASS MANIFOLD



PRECISION REFRIGERANT GAUGES

WITH HI-VISIBILITY COLOR-CODED REFRIGERANT SCALES

- **Superior Shock Resistance** - Our unique design isolates the movement from the socket, reducing the effects of shock.
- **Superior Vibration Resistance** - Our enhanced vibration dampening design cushions the movement for flutter-free performance and extended gauge service life.
- **Superior Pulsation Resistance** - After 10 million cycles, these gauges show three times less wear than conventional gauges. The result is a longer lasting, more reliable gauge.

2-1/2" GAUGES

- 1/8" MNPT Connections
- 3 : 2 : 3% Accuracy
- Replacement Screw-on Lens Set- S8230301
- Protective Red & Blue Rubber Boot Set - 400-RB



Protective rubber boots for 2-1/2" gauges sold separately.

PART NO.	DESCRIPTION	GAUGE CALIBRATION					TEMP	
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C
R-12, R-134a								
441-CB	Blue Compound	●					●	
441-CR	Red Pressure	●					●	
R-12, R-22, R-502								
323-CR	Red Pressure	●					●	
325-CB	Blue Compound	●					●	
405-CB	Blue Compound	●	●					●
405-CR	Red Pressure	●	●					●
423-CAM	Red Pressure			●				●
423-CAPD	Red Pressure					●		●
423-CK	Red Pressure				●			●
423-CKP	Red Pressure	●			●			●
423-CR	Red Pressure	●					●	
425-CAM	Blue Compound			●				●
425-CAPD	Blue Compound					●		●
425-CB	Blue Compound	●					●	
425-CK	Blue Compound				●			●
425-CKP	Blue Compound	●			●			●
431-CM	Red Pressure	●		●			●	
432-CM	Blue Compound	●		●			●	
R-22, R-404A, R-410A								
422-CB	Blue Compound	●					●	
422-CR	Red Pressure	●					●	
R-32, R-410A *NEW*								
453-CB	Blue Compound	●			●			●
453-CR	Red Pressure	●			●			●

PART NO.	DESCRIPTION	GAUGE CALIBRATION					TEMP	
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C
R-22, R-407C, R-410A								
406-CB	Blue Compound	●						●
406-CR	Red Pressure	●						●
428-CKP	Blue Compound	●			●			●
429-CKP	Red Pressure	●			●			●
R-22, R-404A, R-507								
426-CKP	Blue Compound	●			●			●
427-CKP	Red Pressure	●			●			●
R-22, R-134a, R-404A								
420-BCKP	Blue Compound	●			●			●
420-RCKP	Red Pressure	●			●			●
424-CB	Blue Compound	●					●	
424-CR	Red Pressure	●					●	
R-134a								
434-BKP	Blue Compound	●			●		●	●
434-RKP	Red Pressure	●			●		●	●
R-134a, R-404A, R-407C								
407-CB	Blue Compound	●	●					●
407-CR	Red Pressure	●	●					●
R-134a, R-404A, R-507								
451-CB	Blue Compound	●					●	
451-CBM	Blue Compound			●	●			●
451-CR	Red Pressure	●					●	
451-CRM	Red Pressure			●	●			●
R-410A								
2423-P	Red Pressure			●		●		●
2425-CP	Blue Compound			●		●		●
408-CB	Blue Compound	●	●					●
408-CR	Red Pressure	●	●					●
452-CB	Blue Compound	●			●		●	●
452-CR	Red Pressure	●			●		●	●

80MM (3-1/8") Class 1 GAUGES *NEW*

- 1/8" MNPT Connections
- 1% Accuracy

PART NO.	DESCRIPTION	GAUGE CALIBRATION					TEMP	
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C
R-404A, R-410A, R-22								
404-CB	Blue Compound	●					●	
404-CR	Red Pressure	●					●	
R-22, R-134a, R-404A								
458-CB	Blue Compound	●					●	
458-CR	Red Pressure	●					●	
R-407C, R-410A, R-22								
459-CB	Blue Compound	●					●	
459-CR	Red Pressure	●					●	
R-410A								
460-CB	Blue Compound	●					●	
460-CR	Red Pressure	●					●	

VAK-CHECK

For proper evacuation and dehydration of refrigeration and air-conditioning systems, an electronic vacuum gauge is an indispensable companion to a vacuum pump. Significant dehydration does not occur until a vacuum of 1000 microns or greater has been achieved. Use of electronic vacuum gauges is the only way to determine when dehydration is occurring and when it is complete.

Imperial-Thermal Engineering Vak-Checks are precision thermistor vacuum gauges designed especially for refrigeration and air-conditioning service. They automatically compensate for changes in ambient temperature and permit continuous monitoring during evacuation. These instruments are compact, lightweight, easy to use, and read directly in microns on a large easy-to-read meter.

VAK-CHECK

4501

Features

- Atmosphere to 10 microns.
- Ambient temperature compensated.
- Accuracy: 200-1000 microns: $\pm 5\%$.
- Comes complete with Model 4510 Sensor.
- Battery powered, no searching for outlets (2"D" cell batteries not included).



SUPER VAK-CHECK II

14571

This analog thermistor vacuum gauge allows you to choose between 110AC and battery as your power source with the same features as the Model 4501.

Features

- AC/battery operated.
- Range: Atmosphere to 10 microns.
- Ambient temperature compensated.
- Complete with Model 4510 Sensor.
- Accuracy: 200-1000 microns $\pm 5\%$.
- Power: 110AC or 2"D" cell batteries (Batteries not included).



REPLACEMENT VACUUM SENSORS

4510

Features

- Vacuum Sensor for Vak-Check and Super Vak-Check II.
- Models 4501 and 14571 with 0 to 50 calibration scale.



VAC-SCALE

Saving the service technician time and money, Imperial-Thermal Engineering provides the ability to combine digital hand held vacuum gauge technology with strain gauge technology for refrigerant charging.

HANDHELD DIGITAL MICRON GAUGE

4775

Backed by more than 45 years of vacuum technology the 4775 borrows from the old while incorporating advanced new features including (7) units of measure, an LCD backlight, LCD contrast control, and a vacuum minimum/maximum function that stores the last vacuum reading in memory. Lightweight and easy to use, the 4775 will provide the discriminating service technician with a dependable instrument for accurately measuring vacuum in an air-conditioning or refrigeration system.

Features

- Ergonomic durable case.
- Auto shutoff.
- LCD backlight and contrast.
- Multiple units of measure.



HI-PERFORMANCE CHARGING HOSE

PolarShield® CHARGING HOSE 950, 900, 850 & 800 SERIES



- **All Imperial® PolarShield® charging hoses are UL recognized** and meet UL-1963, SAE-J2196 & EPA requirements for strength, pressure and refrigerant permeation.
- **Rugged, Multi-Refrigerant Nylon Barrier Construction** - PolarShield hoses are compatible with all CFC, HFC & HCFC refrigerants (R-410A, R-404A, R-407C, R-134a).
- **High-Pressure** - PolarShield hoses feature 800 PSI working pressure and 4,000 PSI burst pressure with a 5-to-1 safety factor.
- **Selection** - PolarShield hoses are available with a variety of end connections, in yellow, red or blue, individually or in sets of three. Consult factory for lengths and end connections not listed below.

950 SERIES HOSES WITH LOW LOSS BALL VALVE SHUT-OFF AND 1/4" FFL* CONNECTIONS

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	953-MRB	953-MRY	953-MRR	953-MRS
5' (60")	955-MRB	955-MRY	955-MRR	955-MRS
6' (72")	956-MRB	956-MRY	956-MRR	956-MRS

*5/16" fittings available-contact factory for part numbers

900 SERIES PolarShield® HOSES WITH AUTOMATIC SHUT-OFF VALVE

Precision engineered automatic low loss 1/4" FFL* shut-off valve traps refrigerant within the hose to eliminate venting and finger burn.

900 SERIES HOSES - (1/4" FFL* CONNECTIONS WITH AUTOMATIC SHUT-OFF ON ONE END)

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	903-MRB	903-MRY	903-MRR	903-MRS
5' (60")	905-MRB	905-MRY	905-MRR	905-MRS
6' (72")	906-MRB	906-MRY	906-MRR	906-MRS

*5/16" fittings available-contact factory for part numbers

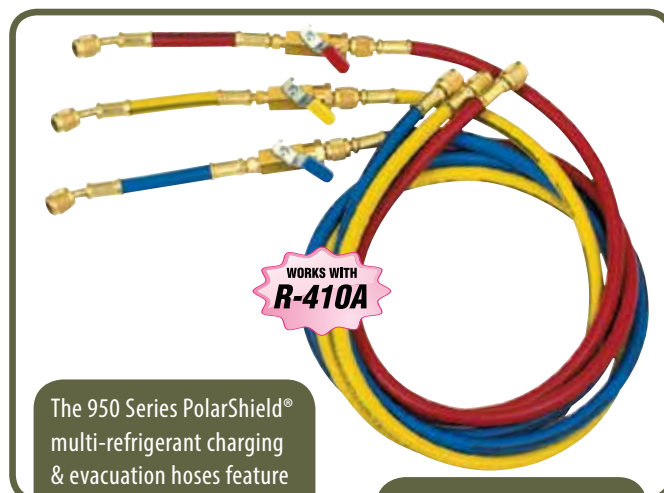
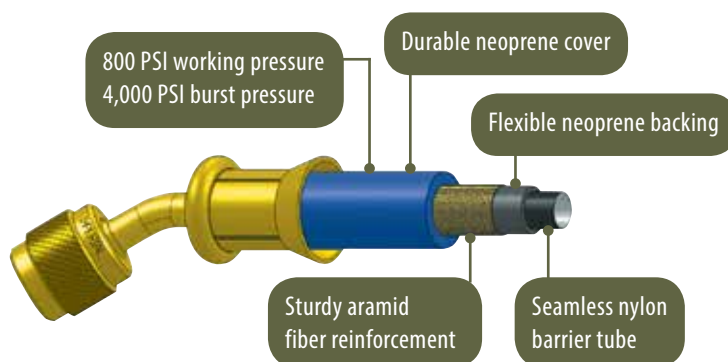
850 SERIES PolarShield® HOSES FOR R-410A SYSTEMS WITH 5/16" ACCESS FITTINGS (1/4" x 5/16" hose connections)

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	853-MRB	853-MRY	853-MRR	853-MRS
4' (48")	854-MRB	854-MRY	854-MRR	854-MRS
5' (60")	855-MRB	855-MRY	855-MRR	855-MRS
6' (72")	856-MRB	856-MRY	856-MRR	856-MRS

800 SERIES PolarShield® HOSES WITH STANDARD 1/4" FITTINGS*

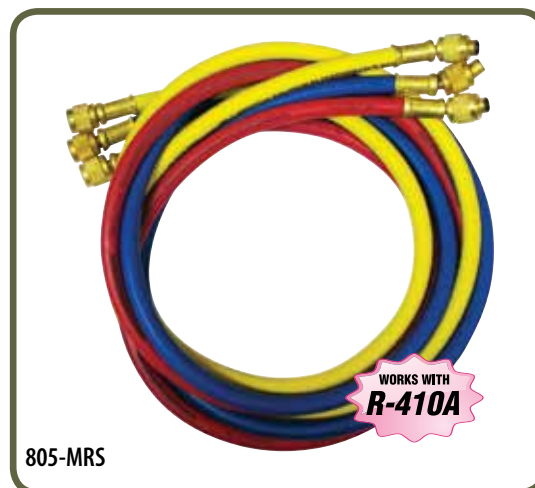
LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	803-MRB	803-MRY	803-MRR	803-MRS
4' (48")	804-MRB	804-MRY	804-MRR	804-MRS
5' (60")	805-MRB	805-MRY	805-MRR	805-MRS
6' (72")	806-MRB	806-MRY	806-MRR	806-MRS
8' (96")	808-MRB	808-MRY	808-MRR	808-MRS
12' (144")	812-MRB	812-MRY	812-MRR	812-MRS

*5/16" fittings available-contact factory for part numbers



The 950 Series PolarShield® multi-refrigerant charging & evacuation hoses feature low loss ball valve shut-off and durable hi-pressure barrier construction.

- UL recognized
- 800 PSI working pressure, 4,000 PSI burst pressure
- Works with all refrigerant gases including R-410A



HI-PERFORMANCE CHARGING HOSE

3/8" EVACUATION HOSE WITH 3/8" SAE SWIVEL CONNECTION

For faster evacuation and charging

3/8" hose in four lengths for larger jobs or applications where reduced service time is desired. 3/8" swivel ends. Eight-crimp ferrules. Available in yellow.

LENGTH	YELLOW
3' (36")	536-FTY
4' (48")	548-FTY
5' (60")	560-FTY
6' (72")	572-FTY



HOSE REPLACEMENT PARTS

- S7958301** 1/4" Hose Seal Gasket.
- S7958302** 3/8" Hose Seal Gasket.
- S8921626** Brass Core Depressor.
- S10000265** 1/2" ACME & 5/16" Hose Seal Gasket.

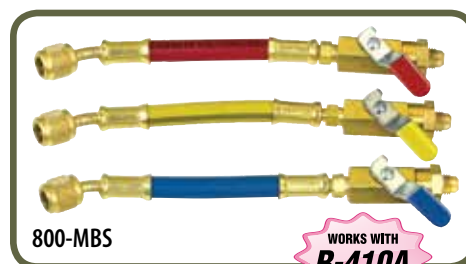
6" LOW LOSS BALL VALVE ADAPTER HOSES

1/4" SAE 45° female x 1/4" SAE male straight fittings

Connects to any 1/4" SAE charging line. Non-restrictive for maximum flow. UL recognized – environmentally safe.



LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
6"	800-MBB	800-MBY	800-MBR	800-MBS



200 SERIES PolarShield® HOSE SETS FOR R-410A

(5/16" x 5/16" hose connections)

LENGTH	SET OF THREE (B,Y,R)
3' (36")	203-MRS
5' (60")	205-MRS
6' (72")	206-MRS

800 PSI Working Pressure; 4,000 PSI Burst Pressure

200 SERIES PolarShield® HOSE SETS FOR R-410A

B, R - 1/4" x 5/16" hose connections
Y - 1/4" x 1/4" hose connection

LENGTH	SET OF THREE (B,Y,R)
3' (36")	213-MRS
4' (48")	214-MRS
5' (60")	215-MRS
6' (72")	216-MRS

800 PSI Working Pressure; 4,000 PSI Burst Pressure

600 SERIES PREMIUM CHARGING HOSE

(1/4" x 1/4" hose connections)

LENGTH	SET OF THREE (B,Y,R)
3' (36")	603-MRS
5' (60")	605-MRS
6' (72")	606-MRS
12' (144")	612-MRS

600 PSI Working Pressure; 3,000 PSI Burst Pressure

HOSE CONVERSION ADAPTERS

The Imperial-Thermal Engineering conversion adapter consists of a compact ball valve that is ideal for retrofitting standard refrigerant hoses, providing instant refrigerant shut off capabilities. Available in standard 1/4" and 5/16" sizes for R-410A.



PART NO.	DESCRIPTION
TE-BV01R	1/4 SAE X 1/4 F SAE
TE-BV01Y	1/4 SAE X 1/4 F SAE
TE-BV01B	1/4 SAE X 1/4 F SAE
TE-BV01-3	1/4 SAE X 1/4 F SAE, SET OF 3
TE-BV02R	1/4 SAE X 5/16 F SAE
TE-BV02Y	1/4 SAE X 5/16 F SAE
TE-BV02B	1/4 SAE X 5/16 F SAE
TE-BV02-3	1/4 SAE X 5/16 F SAE, SET OF 3



KWIK-COUPLER® ADAPTERS

HOSE SHUT-OFF ADAPTERS

The Kwik-Coupler® adapter set is intended for use with refrigeration and air-conditioning service hoses when connecting to core valve type access fittings. Conventional threaded connecting is converted to push-pull operation which is faster, easier and positive sealing at all times. Valve cores are depressed automatically without adjustments or loss of refrigerant. Disconnecting is also accomplished without loss of refrigerant.

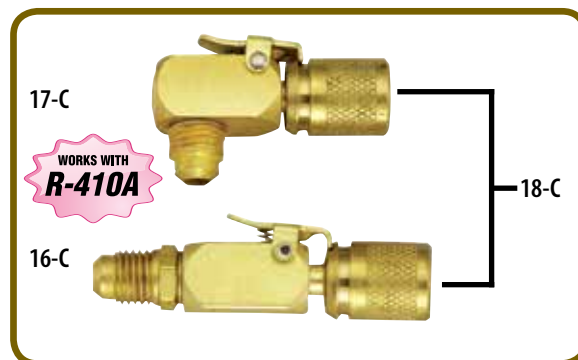
An automatic shut-off valve retains refrigerant pressure in a disconnected hose. This feature permits transferring high side hose refrigerant through the service manifold into the low side, thereby eliminating waste and hazardous high pressure discharge and atmospheric damage.

Features

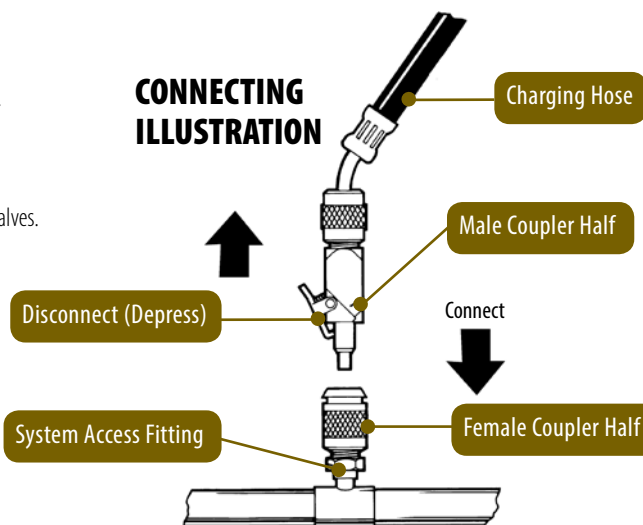
- Automatic full depression of core valves without adjustment, regardless of core position.
- Coupler halves separately connect to access fitting and hose end, then easy push/pull operation automatically opens or closes system without loss of refrigerant.
- Automatic shut-off of hose ends permits discharging high side hose through manifold into low side.
- Eliminates hazardous discharge of refrigerant and oil from system when disconnecting hose.
- Simplifies operation of charging critical amount of refrigerant into small systems.
- Prevents finger burn when disconnecting - especially servicing heat pumps in cold weather.
- Core depressors in hose ends no longer necessary - speeds servicing of systems with hand valves.

- 16-C** Straight Coupler (45° Flare) 1/4" female x 1/4" male.
17-C 90° Elbow Coupler (45° Flare) 1/4" female x 1/4" male.
18-C (Set) includes 16-C and 17-C.
26-C Straight Coupler (45° Flare) 5/16" female x 5/16" male.
27-C 90° Elbow Coupler (45° Flare) 5/16" female x 5/16" male.
 26-C and 27-C.

WORKS WITH
R-410A



CONNECTING ILLUSTRATION



WARNING: Do not allow any refrigerant cylinder, connected for charging, to be exposed to system high side pressure cylinder - explosion could result!

AUTOMOTIVE KWIK-COUPLER® ADAPTER FOR R-12

- 20-A** High side adapter. Converts 3/16" system access valve to 1/4" access valve for use with standard 1/4" charging hose.



20-A



24-C

HI-DUTY® SHUT-OFF COUPLER

- Coupler captures refrigerant within hose, eliminating refrigerant loss, atmospheric damage and finger burns.
- Connects quickly & easily to any standard 1/4" SAE refrigerant hose.
- Solid brass construction for years of dependable service.
- Innovative modular design permits easy field repairs.

SHUT-OFF COUPLER

PART NO.	DESCRIPTION
24-C	90 Degree 1/4" SAE Shut-Off Coupler
25-K	Coupler Service Kit

KWIK-COUPLER® ADAPTERS

KWIK-COUPLER® REPAIR KITS

The Kwik-Coupler® adapter repair kit is intended for use with Imperial® brand 16-C, 17-C, 18-C and 19-C Kwik-Coupler® adapters and PolarShield® KC-Series hose. The male repair kit includes a threaded hex sleeve for replacement on straight coupler assemblies.

KCK-M Male Kwik-Coupler® Adapter Repair Kit - Repairs 2 Male Couplers

Includes: Hex Sleeve (2), Spring (2), Stem Assembly (2) and Sealant

REPAIR INSTRUCTIONS

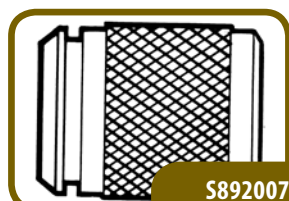
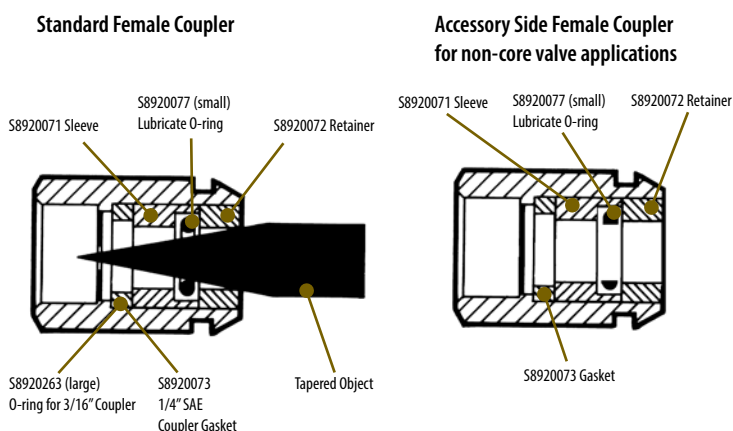
1. Remove threaded sleeve on end of Kwik-Coupler® adapter. A vise may be necessary to remove old straight sleeve - the 90° has a screwdriver slot on back for removal.
2. Discard old stem and spring.
3. Use a wire brush to clean sealant residue from disassembled parts.
4. Insert new stem and spring.
5. Apply one bead of thread sealant completely around the thread. Do not apply an excessive amount of sealant - this may damage o-ring seal and cause leakage. Assemble to length at right (Fig. 1 & 2). For 90° style, engage threads until the bottom of the slot is even with the back of the coupler (Fig. 4).
6. Allow sealant to cure at least 30 minutes. The Kwik-Coupler® adapter is now ready to use.

KCK-F Female Kwik-Coupler® Adapter Repair Kit - Repairs 5 Standard and 5 Automotive Female Couplers (Not for 26-C and 27-C)

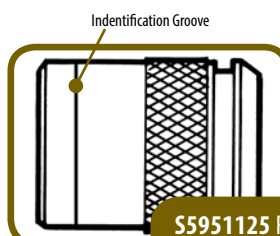
Includes: Retainer (2), Gasket (5), O-Ring (10) and O-Ring 3/16" for Automotive (5)

REPAIR INSTRUCTIONS

1. Insert tapered object (pen or pencil) and press against threaded retainer. Unscrew and remove retainer, sleeve and rubber seals.
2. Lubricate new seals and reassemble. Tighten retainer to zero clearance plus 1/8" turn. The Kwik-Coupler® adapter is now ready for use.



S8920074 1/4" Female Coupler



S5951125 Female Coupler (accessory side)

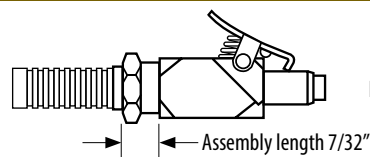


Figure 1

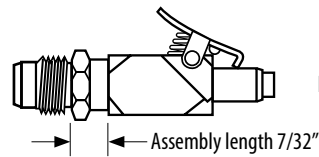


Figure 2

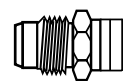


Figure 3
Hex sleeve

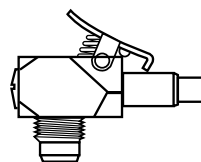


Figure 4
90° assembly

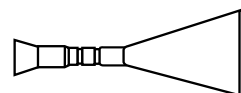


Figure 5
Sealant



Figure 6
Spring

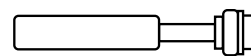


Figure 7
Stem assembly

KCK-M Male Kwik-Coupler® Adapter Repair Kit

KWIK-COUPLER® ADAPTER REPLACEMENT PARTS

PART NO.	DESCRIPTION	USED ON
S8920071	Female Coupler 1/4" & 3/16"-Sleeve	16-C, 17-C, 18-C, 19-C
S8920072	Female Coupler 1/4" & 3/16"-Retainer	16-C, 17-C, 18-C, 19-C
S8920073	Female Coupler 1/4"-Gasket	16-C, 17-C, 18-C, 19-C
S8920074	Female Coupler 1/4"-Low Side	16-C, 17-C, 18-C, 19-C
S8920077	Female Coupler 1/4", 3/16" & 5/16"-O-Ring	16-C, 17-C, 18-C, 19-C
S8920263	Female Coupler 3/16"-O-Ring	19-C
S5951125	Female Coupler 1/4"-for Non-Core Valve Application	16-C, 17-C, 18-C, 19-C
KCK-F	Repair Kit For All Female Couplers	
KCK-M	Repair Kit For All Male Couplers	

REFRIGERANT CHARGING & RECOVERY

KWIK-VISE™

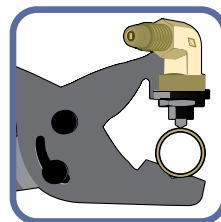
Refrigerant Recovery Tool

- PT-109** Line piercing/refrigerant recovery tool pierces, seals and locks on to copper lines in one swift motion.
- Self-adjusting! No need to adjust the tool for different sizes of tubing. The tension system automatically locks pliers on copper tubing 1/4" to 1/2" (6 mm-12 mm) O.D.
- To use, simply position the PT-109 on the tubing to be pierced. Close the pliers quickly and firmly. The pliers will automatically adjust and lock into a tightly sealed, secure position.

Features

- Replaceable hardened, stainless steel pierce and brass valve assembly (S16002045).
- Capacity: 1/4" thru 1/2" O.D. refrigerant copper tubing.
- Durable: made with high-carbon, heat treated steel jaws.
- Works with all refrigerants CFC, HFC, HCFC and Zeotropic, Azeotropic.
- 90° elbow valve eliminates tangling and interference problems.

S16002045 Replacement pierce and brass valve assembly.



PT-109



KWIK CHARGE®

Liquid Low Side Charger

Provides fast, safe charge - essential for today's blended refrigerants!

The Kwik Charge® charging unit accepts liquid refrigerant from the cylinder and discharges into low side of the system. Charging rate is up to eight times faster than vapor charging. In addition, liquid charging is required when using R-410A and other blended refrigerants. Attach the Kwik Charge device to the low side of the charging manifold. Charging hose is connected from Kwik Charge device outlet to low side of refrigeration system. Internal metering element reduces liquid flow to a level below capacity of compressor. This assures a safe, fast charge without endangering the compressor. A built-in ball check valve automatically opens when drawing a vacuum to assure rapid, unrestricted evacuation. Can be used with all fluorinated hydrocarbon refrigerant systems.

Features

- Up to 8 times faster than vapor charging.
- No need to heat refrigerant cylinder.
- Built-in check valve opens for drawing unrestricted vacuum.
- No pressure drop in cylinder.
- One charger services all units 1/2 ton or larger.

535-C Kwik Charge® charging unit 1/4" female SAE flare inlet, 1/4" male SAE flare outlet.

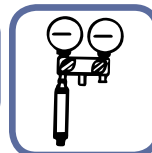
WORKS WITH
R-410A



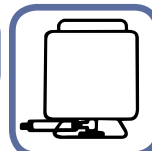
535-C

CONNECTION TO MANIFOLDS
(connect all hoses as usual)

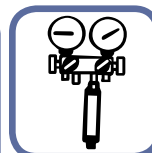
2-Valve Connect Kwik Charge® charger to low side fitting. Arrow downward.



Can be connected to refrigerant cylinder rather than manifold.



4-Valve Unscrew end fitting & reverse, then connect to refrigerant fitting as shown (flow arrow on body points upward).



REFRIGERANT CHARGING & RECOVERY

VIZI-VAPR CHARGER

7701

Many problems can arise from improper charging of any type of refrigeration system. Vizi-Vapr makes it possible to correctly charge a system every time. Liquid refrigerant being charged is transformed into a saturated vapor through a small orifice which thereafter can be viewed to ensure the system gets charged properly.

The Vizi-Vapr eliminates the problem of slow vapor charging by removing the refrigerant from the cylinder as a liquid and injecting it into the system as a saturated vapor. Since the liquid refrigerant is removed from the cylinder by its own pressure, no heat is removed from it and the cylinder does not get cold. Refrigerant blends must be removed from their containers as liquid. Using the Vizi-Vapr, the blend can be charged into the system as a saturated vapor without any composition change. Vizi-Vapr is adjustable from 1/8hp up to 50hp. The operation is completely visible so there is little danger of liquid entering the system.

VIZI-VAPR REPAIR KIT

7701RK

Complete set of gaskets, "O" rings, and back-up rings required for repairing the 7701 Vizi-Vapr.



WORKS WITH
R-410A

7701

PIERCING VALVES

3-IN-1 PIERCING VALVE

Fast, easy, secure installation. Provides access to line at any point for charging, testing or evacuation. Two valves cover 3/16" to 5/8" O.D. tubing. Has depressor valve and needle valve shut-off.

Valve clamps on tubing line with two captive slotted-head screws: positive built-in mechanical stop for each tube size eliminates tightening guesswork. To pierce tube, thread down the combination 1/4" flare port, stem and needle using knob furnished or a suitable wrench, back off stem and connect depressor-type hose for testing or charging. After service is completed valve is closed and left on line for future service. Dust cap provided.

Three-point sealing [in Fig. 1: (1) needle-type valve, (2) gasket and (3) check valve] prevents leakage. Neoprene seal withstands temperatures near 300°F.

541-C Fits 3/16", 1/4" and 5/16" O.D. tubing.

542-C Fits 3/8", 1/2" and 5/8" O.D. tubing.

FITS THREE SIZES

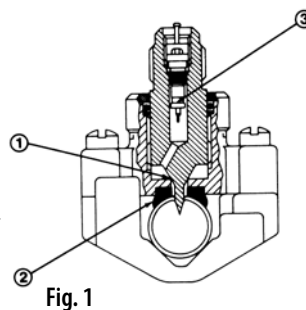
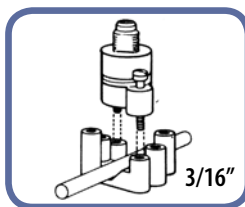
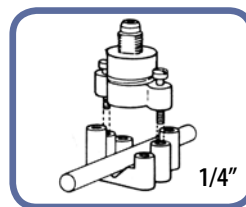


Fig. 1

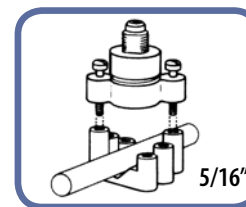
541-C



3/16"



1/4"



5/16"

ACCESS VALVES & ADAPTERS

ACCESS FITTINGS/SWIVEL ADAPTERS

9-C Straight adapter, 1/8" female pipe by 1/4" SAE female swivel connection.



ACCESS VALVES

These valves are designed to facilitate charging and testing of refrigeration systems.

Furnished with flare cap on valve end.



Replacement Valve
Cores

PART NO. G6400



Wrench Caps

PART NO. G6600



7025

VALVE CORE DEPRESSOR

For 1/4" male flares.

PART NO.	DESCRIPTION
7025	FOR 1/4" MALE FLARES

R-410A BRASS ADAPTER

Convert new R-410A system ports with 5/16" SAE connections to 1/4" SAE.

WORKS WITH
R-410A



TE-BA01

PART NO.	MALE	FEMALE	OTHER	APPLICATION
TE-BA01	1/4" SAE	5/16" SAE	W/ CORE AND DEPRESSOR	R-410A INTERNATIONAL

R-410A 45° BRASS ADAPTER

Convert new R-410A system ports with 5/16" SAE connections to 1/4" SAE at 45°.

WORKS WITH
R-410A



TE-BA0145

PART NO.	MALE	FEMALE	OTHER	APPLICATION
TE-BA0145	1/4" SAE	5/16" SAE	W/ CORE AND DEPRESSOR	R-410A INTERNATIONAL

CALCULATORS

TROUBLESHOOTING CALCULATOR

5175

This calculator simplifies the job of diagnosing cooling system troubles. Ideally suited to the needs of the expert as well as the needs of the trainee, it provides immediate reference, from COMPLAINT to POSSIBLE CAUSE to REPAIR.

Features

- 19 major 'Complaint' sections.
- 127 'Possible Cause' items.
- 32-part 'Trouble Shooting' Index.
- All items keyed to 'Repair' window.



5175

REFRIGERATION CALCULATOR

5300

A time-saving and easy-to-use calculator to supply technical refrigeration data:

- Hermetic terminal colors.
- Thermostatic control settings.
- Pressure control settings.
- Head and back pressures.
- Hermetic motor diagrams.
- Temperature pressure chart.

The calculator graphically shows vital refrigeration data and provides service information not available in any other form.



5300

CAP-CHECK

The Cap-Check is a Imperial-Thermal Engineering innovation that has made cap tube cleaning possible and practical. It is designed to pump a high rate of oil into the cap tube to build up pressures needed to open any plugged cap tube, and will clean partially plugged cap tubes when used with the Imperial-Thermal Engineering Chaser Kit.

CAP-CHECK

1003

Cap-Check is a portable, self contained hydraulic power unit with auxiliary equipment especially adapted to cleaning refrigeration capillary tubes. A 0-5000 PSI gauge shows pressure build-up if cap tube is restricted and also shows when chaser has passed through the tube. A 30" high pressure hydraulic hose with a 1/4" SAE male flare outlet connects the cap tube to the Cap-Check for simple handling. An adapter is supplied to connect the cap tube directly to the hose outlet without a flared fitting.



1003

CAP-CHECK CHASER KIT

1101

Chaser Kit is the only means available to clean partially plugged cap tubes. It must be used with the Imperial-Thermal Engineering Cap-Check since no other cap tube cleaning tool provides a rate of oil flow large enough to remove partial restrictions even from the smallest cap tubes. The Chaser Kit consists of 10 spools of lead alloy wire which can be used as a chaser for the 10 most popular sizes of cap tubes (.028, .031, .036, .039, .042, .046, .050, .055, .064, .070). In addition to the wire, a cap tube gauge, a set of sizing tools, and a combination file/reamer are all included in a durable metal case.



1101

CAP-CHECK OUTFIT

5101

Cap-Check Outfit includes both the Cap-Check and Chaser Kit in one compact case along with an extended base that holds the Cap-Check. The Cap-Check can be operated with one hand, allowing high pressures to be easily pumped. Carrying case has clips to hold Cap-Check, Chaser Kit, hose, handle, and extended base.



5101

CAP-CHECK ACCESSORIES

A capillary tube is the most likely place a blockage in a system can occur and can cause a system to operate very inefficiently. Therefore it is essential to have the proper tools on hand to fix this very common problem. Below are accessories that we recommend for the Cap-Check and your service arsenal.

PART NO.	NAME	DESCRIPTION
1003RK	Cap-Check Repair Kit	Complete set of gaskets, "O" rings, springs and balls for Part No. 1003 Cap-Check, with instructions
1011	0-5000 PSI Gauge	High pressure gauge for Part No. 1003 Cap-Check with a pressure range from 0-5000 PSI
1012	30" Hydraulic Hose Replacement	30" high pressure hydraulic hose with a 1/4" SAE male flare outlet
1102	Cap-Gauge	Pocket knife type cap tube gauge with 10 stainless steel gauges to measure the most popular sizes of cap tubes (.028", .031", .036", .039", .042", .046", .050", .055", .064", .070")
1201	Carrying Case	Heavy duty case provides maximum protection from wear and tear when not in use
1301	Extended Base	Extension for the base of the Cap-Check providing better accessibility in certain situations

HEATERS

Quick and easy process of pressurizing a refrigerant supply cylinder to move any refrigerant to another vessel.

CYLINDER HEATER

3054

A quick, convenient, easy-to-use means to pressurize refrigerant supply cylinders to move any refrigerant to another vessel or charging dispenser, the 3054 Cylinder Heater is designed to fit 30lb. and 50lb. containers. It also can be used on 125lb. cylinders and fits the refrigerant cylinders in many recovery units. The device consists of a 6" x 28" flexible silicone rubber heating element with extra-long Velcro straps, built-in molded thermostat, and power cord. The heater draws 200 watts at 120 VAC and has a 135° preset thermostat.

3054-230V 230 Volt model available for European market.



CHARGING SCALES

CHARGING SCALE

4900

The 4900 refrigerant charge scale is the ideal choice for field service work. With a high resolution LCD screen that reads in both lbs. and kg., this scale comes packaged in a convenient carrying case and is powered by (1) 9 volt battery (included).

Features

- Battery operated (9V) for ease of portability.
- 220lbs. (100kg.) capacity.
- High resolution LCD screen with backlight capability.
- Automatically powers off.
- 5g, 0.25oz. resolution.
- Readout in lbs. or kg.
- Zero/Tare capable.
- Weight 6.5lbs.
- Extra sturdy aluminum bound case.

Convenient solution for refrigerant charging. Easy to use, even easier to carry around.



OIL PUMPS & ACCESSORIES

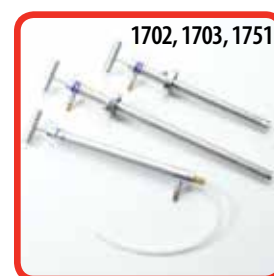
OIL PUMPS & ADAPTERS KITS

CHARGE-OIL PUMP

It charges without pumping the compressor down thus reducing charging time by over 70%. Also avoids the embarrassment of spilling oil on the customer's premises. Provides the professional touch since oil can be accurately measured into the compressor without having to pour it from the can. Fits all popular brands of refrigeration oil.

Complete Adapter Kit supplied to accommodate most containers. The Charge-Oil Pump cap seals the can so pump need not be removed until can is empty. The piston type high pressure pump is designed to operate at pressures to 250 PSI. Pumps one quart in 20 full strokes of the piston. Pump is connected to compressor by refrigerant charging line or copper tubing from 1/4" male fitting.

Suitable for use with alkylbenzene and POE oils.



PART NO.	DESCRIPTION
1702	Charge-Oil Pump
1703	Charge-Oil Pump for 5 Gallon Can

CHANGE-OIL PUMP

1751

1751 Change-Oil Pump is a companion to the 1702 Charge-Oil Pump. It has been designed for use in pumping oil from refrigeration compressors, marine engines, and other equipment where it is impossible to drain oil in the conventional manner. Removing oil from refrigeration compressors before dehydrating with vacuum is a necessity. Suction tube is 5/16" OD semi-rigid plastic, 15" long. Suction tubes up to 60" long can be used if necessary. Will not pump under pressure. Pumping capacity about 10 strokes per quart.

ADAPTERS & REPAIR KITS		
PART NO.	NAME	DESCRIPTION
1705	1702 & 1703 Repair Kit	Complete set of gaskets, bearings, rings, springs and washers for the repair of Imperial-Thermal oil pumps
1751RK	1751 Repair Kit	Complete set of gaskets, bearings, rings, springs and washers for the repair of Imperial-Thermal oil pumps
1768	Adapter Kit	Adapter kit for all popular cans and bottles of refrigerant oil. Kit contains 5 rings and one spacer to accommodate most oil containers
1770	Adapter Kit	Suction adapter for aluminum Charge-Oil Pump. Converts part no. 1702 Charge-Oil Pump into suction pump for refrigeration, marine and other similar applications where it is impossible to draw oil in the normal manner

VACUUM PUMP ACCESSORIES

These vacuum accessories will help you make easy vacuum connections in many types of systems.

MINI-VAC

1833

Mini-Vac is a compact High Vacuum Manifold which provides a 3/8" flare yoke and an electronic vacuum gauge sensor port (sensor not included). Features a 3/8" packless diaphragm valve to isolate the vacuum pump from the system. The Mini-Vac mounts on the pump with a 3/8" quick coupler.

Pictured with optional digital vacuum gauge.



1833

MANIFOLD GASKET SET

1843

Gasket set for Part No. 1833 Mini-Vac.

MINI-VAC MANIFOLD AND 0-30" VACUUM GAUGE COMBO

1834

Combination of Part No. 1833 Mini-Vac Manifold and 0-30" mechanical vacuum gauge which attaches to the sensor port.

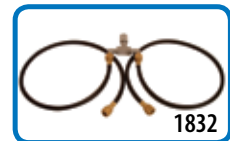


1834

VACUUM TEE

1832

Vacuum Tee for evacuating from two ports with one vacuum source. (2) 3/8" MFL x 3/8" quick coupler. Includes (2) 3/8" x 1/4" x 6' (72") high vacuum hoses.



1832

3/8" EVACUATION HOSE WITH 3/8" SAE SWIVEL CONNECTION

For faster evacuation and charging

3/8" hose in four lengths for larger jobs or applications where reduced service time is desired. 3/8" swivel ends. Eight-crimp ferrules. Available in yellow.

LENGTH	YELLOW
3' (36")	536-FTY
4' (48")	548-FTY
5' (60")	560-FTY
6' (72")	572-FTY



VACUUM PUMP OIL

1813

Keeps any high vacuum pump at maximum performance. No pump can deliver a lower pressure than its sealing oil's vapor pressure. This oil must have the viscosity to lubricate and seal clearances in the pump's moving parts at the extreme temperatures developed during continuous use.

- Premium quality mineral oil formulated to tolerate exposure to vacuums of 5 microns.
- Resists the formation of deposits and maintains its original lubricating properties over a long life.
- Offers very high vacuums, excellent lubrication, and long oil life.
- Available in 1qt. (6 per case) and 1 gal. containers (4 per case).

PART NO.	CASE SIZE	GRAVITY, API	VISCOSITY	FLASH POINT	PRESSURE, MICRONS, HG, MAX
1813	(6) Quart Containers	29.2	SUS AT 100°F, 335	450°F	5
5000	(4) Gallon Containers	29.2	SUS AT 100°F, 335	450°F	5



LIQUI-VAC

4036 & 4036-Q

Features

- Sets up quickly.
- Remains flexible.
- Seals to 1 micron.
- Ready to use.

A real time-saver in servicing cooling systems, Liqui-Vac is the only liquid sealant with the capacity of sealing high vacuum connections. It will positively seal high vacuum leaks around threads, through flared connections, face joints, wherever metal joins metal. Liqui-Vac sets up quickly, but remains flexible for easy disconnection. Liqui-Vac is resistant to most solvents, can seal to 1 micron, and withstands temperatures from -100°F to +325°F.

4036 4 oz. brush-in-cap can (Sold 12 per case)

4036-Q 1 qt. can with brush-in-cap



CHARG-CHECK

Accurately charge your refrigeration system with Charg-Check, available in a number of sizes to suit your needs.

CHARG-CHECK

Features

- Comes in three sizes to suit any application, 1lb. (16oz.), 5lb. (80oz.), and 10lb. (160oz.) sizes cover the field from light domestic to heavy commercial.
- Allows you to measure out precise quantities of refrigerant.
- Helps speed up the charging process by letting you charge with heat. All cylinders except the 16oz. model will hold a Model 7020 Heater Assembly. (See below).
- Allows you to carry small quantities of refrigerant to the job, yet buy refrigerant in large quantities and keep the drum back at your shop.
- Is available in a steel carrying case to completely protect them from tough use. Cylinder need not be removed from the case as all connections and valves are accessible from front. Case forms a stand to set on the floor or bench. Case sold separately. (See below).
- Easily used in the field. They hang onto system being charged by means of a top-mounted bail.
- Can be calibrated for ambient temperature variations by means of temperature correction chart on the side of the scale. This is required only if better than 2% accuracy is needed.
- Safety relief valve for protection.
- Plastic liquid level indicators.

R-12, R-22, R-502 MODELS

PART NO.	CAPACITY	GRADUATION
7001	16 oz.	1/2 oz.
7002*	16 oz.	1/2 oz.
7005	80 oz.	1 oz.
7006*	80 oz.	1 oz.
7009	160 oz.	2 oz.
7010*	160 oz.	2 oz.

*CARRYING CASE INCLUDED

HFC-134A MODELS WITH 1/4" SAE FITTINGS

PART NO.	CAPACITY	GRADUATION
U7001	16 oz. (450 G)	1/8 oz. (5 G)
U7002*	16 oz. (450 G)	1/8 oz. (5 G)
U7005	80 oz. (2250 G)	1 oz. (25 G)
U7006*	80 oz. (2250 G)	1 oz. (25 G)
U7009	160 oz. (4500 G)	2 oz. (50 G)
U7010*	160 oz. (4500 G)	2 oz. (50 G)

*CARRYING CASE INCLUDED

GASKET SETS AND REPAIR KITS

Charg-Check Repair kits contain a complete gasket set and replacement gauge.

PART NO.	DESCRIPTION
7001GS	Gasket set for 16 oz. CHARG-CHECK
7001RK	Repair kit for 16 oz. CHARG-CHECK
7003GS	Gasket set for 2-1/2 lb. CHARG-CHECK
7003RK	Repair kit for 2-1/2 lb. CHARG-CHECK
7005GS	Gasket set for 5 lb. CHARG-CHECK
7005RK	Repair kit for 5 lb. CHARG-CHECK
7009GS	Gasket set for 10 lb. CHARG-CHECK
7009RK	Repair kit for 10 lb. CHARG-CHECK

CARRYING CASES FOR THE CHARG-CHECK SERIES

An ideal way to protect the Charg-Check cylinder from various damage including a broken sight glass. The carrying cases are constructed of 20 gauge steel and supplied with a durable powder coat finish.

PART NO.	DIMENSIONS	USED WITH
7007	4.25"W x 16.75"H x 3.625"D	7001 / U7001
7008	4.75"W x 23.5"H x 5"D	7005 / U7005
7013	6"W x 25"H x 7"D	7009 / U7009

CHARG-CHECK HEATER ASSEMBLIES

- 7020 120 Volt heater assembly.
 7024 240 Volt heater assembly.



CHARG-CHECK shown with optional carrying case

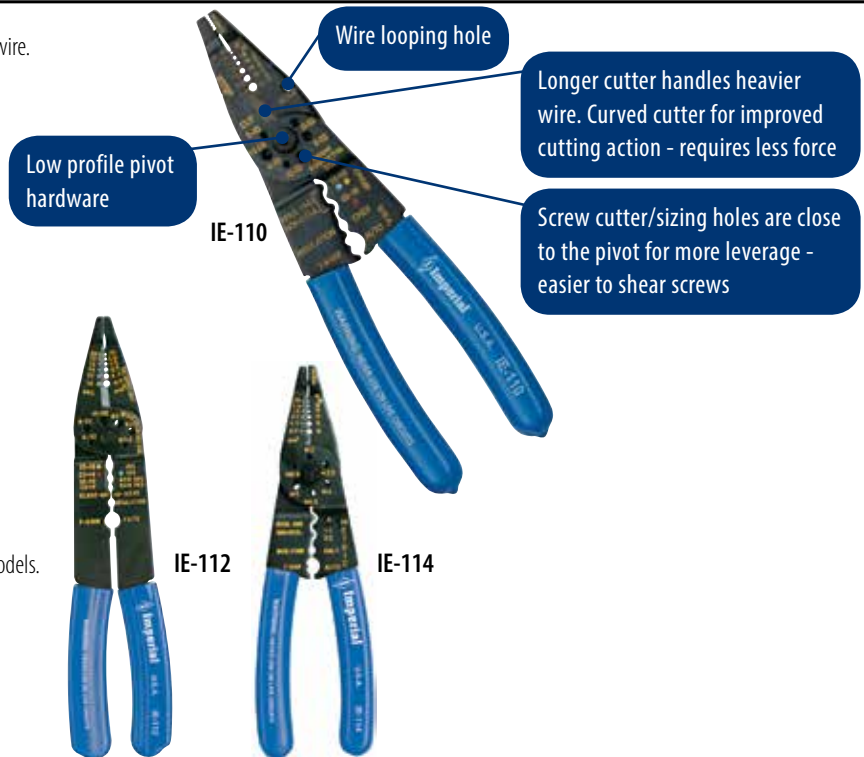
Thread heater assembly into the bottom of the cylinder to increase the speed of the charge.

COMBINATION TOOLS

- (6) upfront, precision-ground stripping stations for solid and stranded wire.
- Wire cutter.
- (6) screw sizing and cutting stations.
- Wire terminal and 7-8 mm automotive ignition crimp stations.
- Highly visible, easy-to-read graphics.
- Cushion grips.

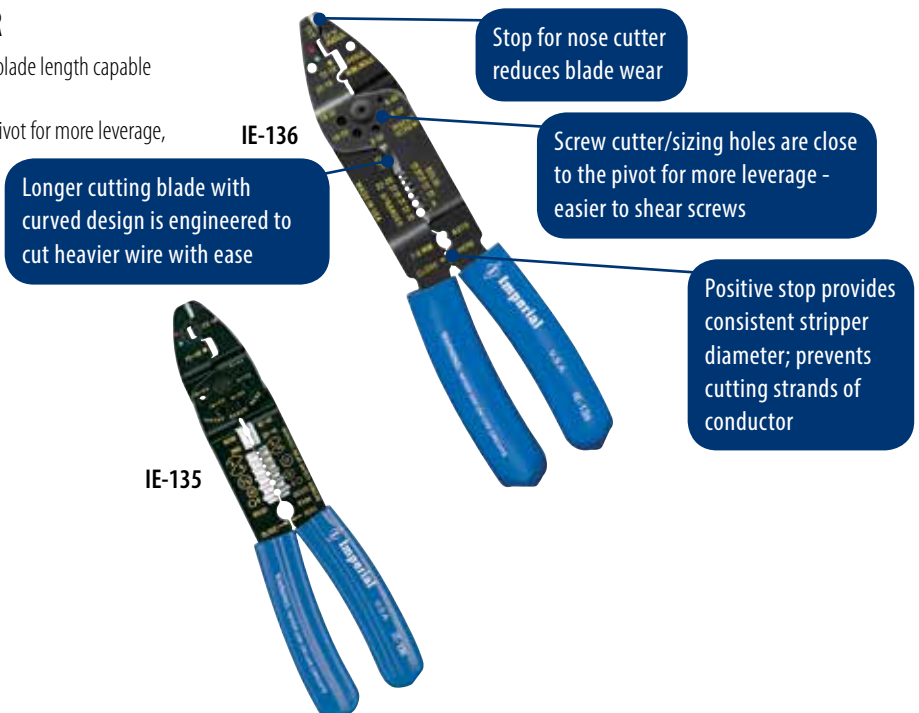
5-IN-1 COMBINATION TOOL

- IE-110**
- Strips: 22/20/18/16/14/12/10 AWG.
 - Crimps insulated and non-insulated: 22-18, 16-10 AWG; non-insulated: Auto 7 & 8 mm.
 - Screw cutter: 4-40 / 5-40 / 6-32 / 8-32 / 10-32 / 10-24.
 - Wire sizes, etc., are embossed in metal and paint-filled.
 - Serrated pliers nose for pulling and looping wire.
 - Air-pocket cushion grips.
 - Available in AWG, metric or combination AWG/metric models.
- IE-112**
- Combination Metric/AWG.
- IE-114**
- Metric version.



UPFRONT CUTTER/CRIMPER/STRIPPER

- IE-136**
- Curved cutter reduces force required to cut; longer blade length capable of cutting NM-B cable in a single stroke.
 - Screw cutter/sizing holes are moved closer to the pivot for more leverage, making it easier to shear screws.
 - Strips: 10-22 AWG.
 - Crimps: insulated 10-22 AWG.
 - Crimps: non-insulated 10-22 AWG, 7-8 mm Auto.
 - Screw cutter: 4-40 / 6-32 / 8-32 / 10-32 / 10-24.
 - Anvil-type wire cutter at nose of pliers.
- IE-135**
- Anvil-type wire cutter at nose of pliers.
 - Insulated and non-insulated crimp stations.
 - Screw sizing and cutting stations.



Conforms to ASME
Standard B107.500-2010

PART NO.	DESCRIPTION	STRIPPER SIZE (AWG)	CUTTER TYPE	CRIMPS INSULATED (AWG)	CRIMPS NON - INSULATED (AWG)	SCREW CUTTER	NOM. LENGTH (in.)
IE-110	Super 5-in-1 Combination	10-22	Curved-long	10-22	10-22 7-8 mm Auto	4-40 / 5-40 / 6-32 8-32 / 10-32 / 10-24	8-1/4
IE-112	Combination Metric/AWG	10-20, 0.75-6.0 mm ²	Straight	10-22	10-22 7-8 mm Auto	6-32 / 8-32 / 10-32 3.5/4.0/5.0 mm	9-1/2
IE-114	Metric	0.75-6.0 mm ² , 10-22	Straight	1.5-6.0 mm 10-22	1.5-6.0 mm, 10-22 7-8 mm Auto	2.5/3.0/3.5/4.0/ 4.5/5.0 mm	8-1/4
IE-135	Crimper/Cutter with 6 Strip Stations	10-22	Anvil	10-22	10-22, 7-8 mm Auto	4-40 / 6-32 / 8-32 / 10-32 / 10-24	8-3/4
IE-136	Upfront Cutter/Crimper Stripper	8-18 Solid 10-22 Stranded	Anvil Curved-long	10-22	10-22, 7-8 mm Auto	4-40 / 6-32 / 8-32 / 10-32 / 10-24	8-1/2

CAM-LOCK™ CONVERTIBLES

FIXED TIP CONVERTIBLE PLIERS

FOR 1/4" TO 2" RINGS

- Unique patented design allows for quick changeover from internal to external use.
- No screws to tighten or come loose.
- For 1/4" to 2" internal and external rings.
- 18° and 90° offsets; 0.038", 0.047" and 0.070" tip diameters.
- Sealed air-pocket cushion grips.

For shaft/bore diameter and ring series reference, see pages 67-68

PART NO.	DESCRIPTION	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
				Int. (Housing)	Ext. (Shaft)	
IR-3818C	Cam-Lock Convertible	.038	18°	●	●	6
IR-3890C	Cam-Lock Convertible	.038	90°	●	●	6
IR-4718C	Cam-Lock Convertible	.047	18°	●	●	6
IR-4790C	Cam-Lock Convertible	.047	90°	●	●	6
IR-7018C	Cam-Lock Convertible	.070	18°	●	●	7-1/4
IR-7090C	Cam-Lock Convertible	.070	90°	●	●	7-1/4
IR-4CK	4-pc. Kit: (.038, .070 tips) w/storage tray					
IR-6CK	6-pc. Kit: (one of each) w/storage case					
IR-6CKCASE	Replacement case for IR-6CK					

High carbon, hardened steel tips and body

Black oxide finish resists rust and corrosion

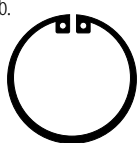
Shift button

IR-7018C

PATENTED

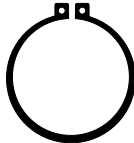
QUICKLY CHANGES FROM EXTERNAL TO INTERNAL

1. Compress handles slightly.
2. Depress shift button.
3. Turn knob.



Internal (Housing)

3/8 in. – 2 in. (10 mm – 50 mm)



External (Shaft)

1/4 in. – 2 in. (6.5 mm – 50 mm)



INTERNAL



EXTERNAL



IR-4CK



IR-6CK

UNIVERSAL CONVERTIBLE RETAINING RING PLIERS

EASY TO CONVERT FROM INTERNAL TO EXTERNAL RINGS – SIMPLY MOVE LEVERS TO SWITCH. NO PINS TO PUSH!

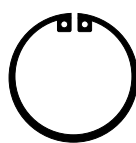
- Patented design allows for quick changeover.
- Replaceable tips held firmly in place by hex-shaped locking guides.
- Tough steel construction for durability and strength.
- Ergonomic anti-slip sealed air-pocket grips for comfort.
- Spring loaded to speed the work.
- Black oxide finish resists rust and corrosion.

IR-92 FOR 1/8" TO 2" DIA. RINGS

Includes five pairs of color-coded precision-ground tips and hex key wrench in convenient storage pouch:

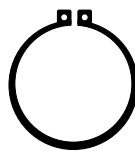
- (2) 0.038 in. Yellow Tips
- (2) 0.038 in. Yellow 90° Tips
- (2) 0.047 in. Green Tips
- (2) 0.047 in. Green 90° Tips
- (2) 0.070 in. Copper Tips

IR-92TP REPLACEMENT TIP KIT



Internal (Housing)

3/8 in. – 2 in. (10 mm – 48 mm)



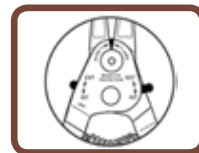
External (Shaft)

1/8 in. – 2 in. (7 mm – 48 mm)

High carbon, hardened steel construction

Replaceable tips

Patented lever design for quick changeover



IR-92

PATENTED

Conforms to ASME
Standard B107.500-2010

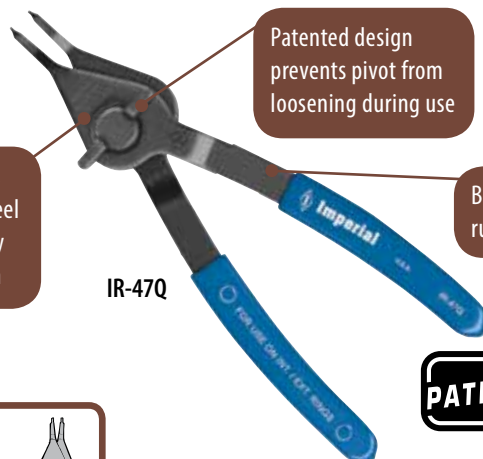
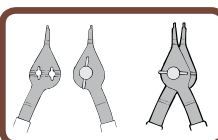
QTR-TURN® CONVERTIBLES

FIXED TIP CONVERTIBLE PLIERS FOR 1/4" TO 3-1/2" RINGS

- Quickly and easily converts from internal (rings in a housing or bore) to external applications (rings on a shaft).
- Pivot will not loosen while using tool.
- Unique patented design provides stability.
- Low profile "T-Knob" for working in tight spaces.
- Available in 12 sizes: 4 tip diameters with straight, 45° or 90° offsets.
- Sealed air-pocket cushion grips for comfort.

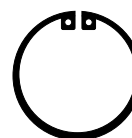
Simple to Use

Convert pliers to internal or external position by rotating "T" knob one-quarter turn; pull handle halves apart and reinstall in other hole. Rotate another quarter turn to lock. (See diagram.)



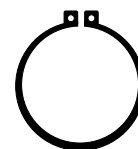
IR-47Q

PATENTED



Internal (Housing)

3/8 in. – 3 in. (10 mm – 76 mm)



External (Shaft)

1/4 in. – 3-1/2 in. (6.5 mm – 89 mm)



For shaft/bore diameter and ring series reference, see pages 67-68

PART NO.	DESCRIPTION	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
				Int. (Housing)	Ext. (Shaft)	
IR-38Q	Qtr-Turn Convertible	.038	0°	●	●	6
IR-3845Q	Qtr-Turn Convertible	.038	45°	●	●	6
IR-3890Q	Qtr-Turn Convertible	.038	90°	●	●	6
IR-47Q	Qtr-Turn Convertible	.047	0°	●	●	6
IR-4745Q	Qtr-Turn Convertible	.047	45°	●	●	6
IR-4790Q	Qtr-Turn Convertible	.047	90°	●	●	6
IR-70Q	Qtr-Turn Convertible	.070	0°	●	●	7-1/4
IR-7045Q	Qtr-Turn Convertible	.070	45°	●	●	7-1/4
IR-7090Q	Qtr-Turn Convertible	.070	90°	●	●	7-1/4
IR-90Q	Qtr-Turn Convertible	.090	0°	●	●	9-1/4
IR-9045Q	Qtr-Turn Convertible	.090	45°	●	●	9-1/4
IR-9090Q	Qtr-Turn Convertible	.090	90°	●	●	9-1/4

IR-6QK PROFESSIONAL 6-PIECE KIT FOR 1/4" TO 2" RINGS

- 0.038", 0.047" and 0.070" tip diameters.
- 0° and 90° offsets.
- Custom-molded impact-resistant storage case.
- Kit weight 2.25 lbs.



IR-6QK

Conforms to ASME
Standard B107.500-2010

IR-12QK PROFESSIONAL 12-PIECE KIT FOR 1/4" TO 3-1/2" RINGS

- 0.038", 0.047", 0.070" and 0.090" tip diameters.
- 0°, 45° and 90° offsets.
- Custom-molded impact-resistant case has storage space for spare rings.
- Kit weight 5 lbs.



IR-12QK

STANDARD CONVERTIBLES

FIXED TIP CONVERTIBLE PLIERS FOR 1/4" TO 3-1/2" RINGS

- Simply move screw to other hole and finger-tighten to convert from internal to external (or reverse).
- Available in straight, 45° and 90° offsets.
- 0.038" to 0.090" tip diameters.
- Cushion grip handles.

For shaft/bore diameter and ring series reference, see pages 67-68

PART NO.	DESCRIPTION	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
				Int. (Housing)	Ext. (Shaft)	
IR-38	Standard Convertible (NSN 5120-00-089-0874)	.038	0°	●	●	6
IR-3845	Standard Convertible (NSN 5120-00-930-9186)	.038	45°	●	●	6
IR-3890	Standard Convertible	.038	90°	●	●	6
IR-47	Standard Convertible	.047	0°	●	●	6
IR-4745	Standard Convertible	.047	45°	●	●	6
IR-4790	Standard Convertible	.047	90°	●	●	6
IR-70	Standard Convertible	.070	0°	●	●	7-1/4
IR-7045	Standard Convertible	.070	45°	●	●	7-1/4
IR-7090	Standard Convertible	.070	90°	●	●	7-1/4
IR-90	Standard Convertible	.090	0°	●	●	9-1/4
IR-9045	Standard Convertible	.090	45°	●	●	9-1/4
IR-9090	Standard Convertible	.090	90°	●	●	9-1/4

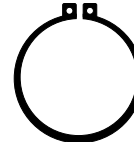
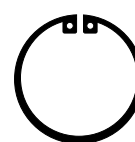


High carbon, hardened steel for durability and strength

Black oxide finish resists rust and corrosion

Conforms to ASME Standard B107.500-2010

IR-47



Internal (Housing)

3/8 in. – 3 in. (10 mm – 76 mm)

External (Shaft)

1/4 in. – 3-1/2 in. (6.5 mm – 89 mm)

To convert pliers to internal or external position, remove thumbscrew. Pull handle halves apart and reposition screw in other hole, then finger tighten.

IR-12K PROFESSIONAL 12-PC. KIT FOR 1/4" TO 3-1/2" RINGS

- 0°, 45° and 90° tip angles.
- 0.038", 0.047", 0.070" and 0.090" tip diameters.
- Impact-resistant case has storage space for spare rings.
- Kit weight 5 lbs.



IR-12K

6-PC. KITS FOR 1/4" TO 2" RINGS

- 0° and 45° or 0° and 90° offsets.
- 0.038", 0.047" and 0.070" tip diameters.
- Impact-resistant case.
- Kit weight 2.25 lbs.

IR-045K 6-pc. kit, 0° and 45° tip angles.

IR-090K 6-pc. kit, 0° and 90° tip angles.



IR-090K

2-PC. MERCHANDISING KITS FOR 3/8" TO 2" RINGS

- Straight, 45° or 90° 2-pc. kits in popular tip sizes.
- Hang card with instructions and ring specs.
- Clear plastic storage case.

IR-47700K Contains IR-47 (0.047", straight) and IR-70 (0.070", straight)

IR-477045K Contains IR-4745 (0.047", 45°) and IR-7045 (0.070", 45°)

IR-477090K Contains IR-4790 (0.047", 90°) and IR-7090 (0.070", 90°)



IR-47700K

INDUSTRIAL AND UTILITY PLIERS

INDUSTRIAL FIXED TIP PLIERS WITH SPRING, STOP & GRIPS* FOR 1/8" TO 3-1/2" RINGS



Internal pliers – for rings
in a housing or bore.

External pliers – for
rings on a shaft.



IR-230S MINI

• 0.023" tip diameter Mini
Pliers feature spring
return and shield to prevent
over-expansion of delicate
1/8" – 15/64" rings.

Spring and Stop eliminates
over-expansion of external
rings; speeds assembly and
removal of internal rings.

IR-380S



INDUSTRIAL PLIERS

For shaft/bore diameter and ring series reference, see pages 67-68

PART NO.	NSN 5120-	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
				Int. (Housing)	Ext. (Shaft)	
Mini Pliers:						
IR-230S**	595-9550	.023	0°		●	5-1/4
IR-0015R**	595-9548	.023	0°		●	5-1/4
IR-0018R**	288-9711	.023	0°		●	5-1/4
IR-2124R	892-4890	.023	45°		●	5-1/4
IR-2154R		.023	45°		●	5-1/4
IR-2184R	024-9527	.023	45°		●	5-1/4
IR-2129R		.023	90°		●	5-1/4
IR-2159R		.023	90°		●	5-1/4
IR-2189R	024-9528	.023	90°		●	5-1/4
IR-250H	596-8665	.025	0°	●		5-1/2
IR-2545H		.025	45°	●		5-1/2
IR-2590H	024-9531	.025	90°	●		5-1/2
IR-380H	293-0048	.038	0°	●		5-1/2
IR-3845H		.038	45°	●		5-1/2
IR-3890H		.038	90°	●		5-1/2
IR-380S	288-9717	.038	0°		●	6-1/4
IR-3845S	288-9716	.038	45°		●	6-1/4
IR-3890S	408-1434	.038	90°		●	6-1/4
IR-470H		.047	0°	●		5-1/2
IR-4745H		.047	45°	●		5-1/2
IR-470S		.047	0°		●	5-3/4
IR-4745S		.047	45°		●	5-3/4
IR-4790S		.047	90°		●	5-3/4
IR-700H	293-0045	.070	0°	●		6-1/2
IR-7045H	801-0957	.070	45°	●		6-1/2
IR-7090H	595-9532	.070	90°	●		6-1/2
IR-700S	293-0049	.070	0°		●	7
IR-7045S	640-6352	.070	45°		●	7
IR-7090S	024-9529	.070	90°		●	7
IR-900H	293-0046	.090	0°	●		9
IR-9045H	520-9863	.090	45°	●		9
IR-9090H	602-4845	.090	90°	●		9
IR-1150S	293-0047	.115	0°		●	9-1/4
IR-11590S	892-5919	.115	90°		●	9-1/4

*Minis do not have a stop and grips. Models IR-1150S and IR-11590S are furnished with spring and grip, but no stop.

**Shielded

UTILITY FIXED TIP PLIERS WITHOUT SPRING, STOP AND GRIPS FOR 1/8" TO 3-1/2" RINGS

IR-380HU



UTILITY PLIERS

For shaft/bore diameter and ring series reference, see pages 67-68

PART NO.	NSN 5120-	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
				Int. (Housing)	Ext. (Shaft)	
IR-250HU	596-1106	.025	0°	●		5-1/2
IR-2545HU	640-6357	.025	45°	●		5-1/2
IR-2590HU		.025	90°	●		5-1/2
IR-380HU	293-2514	.038	0°	●		5-1/2
IR-3845HU	640-6356	.038	45°	●		5-1/2
IR-3890HU		.038	90°	●		5-1/2
IR-380SU	292-2513	.038	0°		●	6-1/4
IR-3845SU	640-6353	.038	45°		●	6-1/4
IR-3890SU	752-9755	.038	90°		●	6-1/4
IR-470HU		.047	0°	●		5-1/2
IR-4745HU		.047	45°	●		5-1/2
IR-4790HU		.047	90°	●		5-1/2
IR-4745SU		.047	45°		●	5-3/4
IR-4790SU		.047	90°		●	5-3/4
IR-700HU	596-0711	.070	0°	●		6-1/2
IR-7045HU	640-6355	.070	45°	●		6-1/2
IR-7090HU		.070	90°	●		6-1/2
IR-700SU	595-9555	.070	0°		●	7
IR-7045SU	640-6352	.070	45°		●	7
IR-7090SU		.070	90°		●	7
IR-90HU	595-0554	.090	0°	●		9
IR-9090HU	793-5052	.090	90°	●		9
IR-1150SU	293-0044	.115	0°		●	9-1/4
IR-11545SU		.115	45°		●	9-1/4

REPLACEABLE TIP PLIERS

REPLACEABLE TIP PLIERS WITH SPRINGS AND GRIPS FOR 3/8" TO 2" RINGS

- One tool handles different size rings by changing tips.
- Spring return.
- Cushion grips.
- Kits feature internal and external pliers with 8 pairs of tips — 2 tools take the place of 16 different pliers!
- Precision-ground replaceable tips also available separately in 0°, 45° and 90° offsets and 4 different tip diameters.

IR-44K SAE KIT

- Two replaceable tip pliers (internal and external) with tip kit IR-8TK (8 pairs).
- Reusable plastic storage case.

IR-44MK HANG CARD KIT - SAE AND METRIC

- Two replaceable tip pliers (internal and external) with SAE and METRIC size tip kit IR-184TK (8 pairs).
- Hang card with instructions and ring sizes.
- Reusable plastic storage case.

For replacement tips and tip kits, see page 64

PART NO.	DESCRIPTION	TYPE	
		Int. (Housing)	Ext. (Shaft)
IR-44K	SAE Kit includes (1) Internal Pliers, (1) External Pliers & IR-8TK Tip Kit (8 pairs) in reusable plastic storage case	•	•
IR-44MK	SAE & METRIC Kit includes (1) Internal Pliers, (1) External Pliers, IR-184TK SAE & METRIC Tip Kit (8 pairs) with hang card instructions in reusable plastic storage case.	•	•
IR-44H	Internal Pliers & IR-182TK Tip Kit (4 pairs)	•	
IR-44S	External Pliers & IR-182TK Tip Kit (4 pairs)		•

For shaft/bore diameter and ring series reference, see pages 67-68

THE PROFESSIONAL'S CHOICE FOR INTERMEDIATE SIZE 1-1/2" TO 4" RINGS IR-50K HEAVY DUTY PLIERS SET

- Two replaceable tip pliers (internal and external) with 8 pairs of tips take the place of 16 separate pliers!
- Spring ratchet lock mechanism minimizes fatigue by allowing the ring to be compressed or expanded through gradual moves and then locked at a desired size without continued pressure on the handles. Heavy and large rings are safely and easily controlled.
- Tips mount directly to pliers for maximum stability.
- Spring return.
- Cushion grips.

Conforms to ASME
Standard B107.500-2010

For replacement tips and tip kits see page 64

PART NO.	DESCRIPTION
IR-50K	Kit includes (1) IR-50H heavy duty internal pliers, (1) IR-50S heavy duty external pliers and (8) pair tips in custom-molded storage case.
IR-50H	Internal pliers only — without tips
IR-50S	External pliers only — without tips

For shaft/bore diameter and ring series reference, see pages 67-68



SAE KIT

Tip kit with 8 pairs
of SAE tips

IR-44K



SAE & METRIC
HANG CARD KIT

SAE and METRIC
size tip kit

IR-44MK



IR-44H

Conforms to ASME
Standard B107.500-2010



IR-50K

High carbon, hardened steel
for durability and strength

Black oxide finish resists
rust and corrosion

Ratchet Lock

(Shown with tips installed)

IR-50H

LARGE & EXTRA-LARGE RATCHETING PLIERS

FOR SAFE & EASY CONTROL OF 3" TO 10" RINGS

- Ratchet Lock mechanism for safe and easy control of large, heavy rings.
- Spring return.
- 0°, 45° and 90° offsets in .120", .150" and .170" tip diameters.
- Precision-ground tips mount directly to pliers for maximum stability.

LARGE PLIERS

PART NO.	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
			Int. (Housing)	Ext. (Shaft)	
IR-120H	.120	0°	●		16
IR-12045H	.120	45°	●		16
IR-12090H	.120	90°	●		16
IR-120S	.120	0°		●	16
IR-12045S	.120	45°		●	16
IR-12090S	.120	90°		●	16

For replacement tips, see page 64

EXTRA-LARGE PLIERS

PART NO.	TIP DIA. (in.)	TIP ANGLE	TYPE		NOM. LENGTH (in.)
			Int. (Housing)	Ext. (Shaft)	
IR-150H	.150	0°	●		29
IR-15045H	.150	45°	●		29
IR-15090H	.150	90°	●		29
IR-170S	.170	0°		●	19
IR-17045S	.170	45°		●	19
IR-17090S	.170	90°		●	19

For replacement tips, see page 64

For shaft/bore diameter and ring series reference, see pages 67-68

IR-120S



1. Loosen ring first with punch or similar tool to remove bond from rust and accumulated dirt.
2. Use largest tip pliers that will fit in holes of ring.
3. Push tips as far into ring holes as possible before squeezing handles.
4. Use minimal pressure needed to remove or install ring.
5. Never use your pliers for anything other than installing and removing retaining rings.



IR-120H



IR-120S



IR-150H



IR-170S

LOCK RING PLIERS

FIXED TIP AND REPLACEABLE TIP PLIERS FOR EXTERNAL RINGS WITHOUT PICKUP HOLES

- For industrial and power transmission lock ring applications.
- Spring return for ease of operation.
- Cushion grips.



FIXED TIP LOCK RING PLIERS

PART NO.	DESCRIPTION	NOM. LENGTH (in.)
IR-15R	Small, Auto Transmission	7-1/2
IR-47R	Standard (NSN 5120-00-595-9551)	8-1/2
IR-48R	Thin Nose	8-1/2
IR-601R	Auto Transmission	9-1/2
IR-602R	Heavy Duty	8-1/2

REPLACEABLE TIP LOCK RING PLIERS

PART NO.	DESCRIPTION	NOM. LENGTH (in.)
IR-LRRL	External Pliers with IR-47R style tips, ratchet lock & spring return	10-1/2
IR-LRS	External Pliers with IR-47R style tips & spring return	14
IR-LHS	Horseshoe style tips (1 pair) for above pliers	



IR-48R



IR-601R



IR-602R



IR-LRRL



IR-LRS

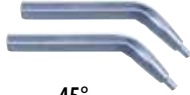


REPLACEABLE TIPS & TIP KITS

- Our proprietary manufacturing process results in a proven method of creating strong, long-lasting replaceable tips for Imperial® pliers.
- Precision-ground and hardened.
- Color-coded by size.
- Kits of common sizes are available.



Straight 0°



45°



90°



IR-50H INTERNAL



IR-50S EXTERNAL

REPLACEABLE TIPS FOR IR-44H AND IR-44S

PART NO.	DESCRIPTION	TIP DIA. (in.)	COLOR	TIP ANGLE	MILBAR® REF#
IR-380T	1 Pair	.038	Black	0°	4435R
IR-3845T	1 Pair	.038	Black	45°	4436R
IR-3890T	1 Pair	.038	Black	90°	4437R
IR-470T	1 Pair	.047	Silver	0°	4445R
IR-4715T	1 Pair	.047	Silver	15°	4448R
IR-4745T	1 Pair	.047	Silver	45°	4446R
IR-4790T	1 Pair	.047	Silver	90°	4447R
IR-700T	1 Pair	.070	Gold	0°	4463R
IR-8TK	Tip Kit, 8 Pair 1 pair each: .038" 0°, 45°, 90°; .047" 0°, 45°, 90°; .070" 0°, 15°				4496R
IR-184TK	Tip Kit, 8 Pair SAE/Metric 1 pair each: .038" 0°, 15°, 45°; .047" 0°, 15°, 90°; .070" 15°; .093" 0°				45R08
IR-182TK	Tip Kit, 4 Pair 1 pair each: .038" 90°; .047" 0°, 45°; .070" 0°				4481R
IR-183TK	Tip Kit, 8 Pair 2 pairs each: .038" 90°; .047" 0°, 45°; .070" 0°				4482R

REPLACEABLE TIPS FOR IR-50H AND IR-50S

(Both pliers use same tip)

PART NO.	DESCRIPTION	TIP DIA. (in.)	COLOR	TIP ANGLE	MILBAR® REF#
IR-593T	1 Pair	.093	Gold	0°	5021R
IR-9345T	1 Pair	.093	Gold	45°	5023R
IR-9390T	1 Pair	.093	Gold	90°	5024R
IR-1080T	1 Pair	.108	Black	0°	5005R
IR-10815T	1 Pair	.108	Black	15°	5006R
IR-10845T	1 Pair	.108	Black	45°	5007R
IR-10890T	1 Pair	.108	Black	90°	5008R
IR-5120T	1 Pair	.120	Silver	0°	5009R
IR-51215T	1 Pair	.120	Silver	15°	5011R
IR-51245T	1 Pair	.120	Silver	45°	5012R
IR-51290T	1 Pair	.120	Silver	90°	5013R
IR-LHS	1 Pair Horseshoe Lock Ring w/ screws				5036R
IR-5108TK	Tip Kit, 4 Pair w/ screws 1 pair each: .108" 0°, 15°, 45°, 90°				5002R
IR-5120TK	Tip Kit, 4 Pair w/ screws 1 pair each: .120" 0°, 15°, 45°, 90°				5003R
IR-5004TK	Tip Kit, 4 Pair w/ screws 1 pair each: .108" 15°, 45°; .120" 45°, 90°				5004R

REPLACEABLE TIPS FOR IR-120H, IR-120S, IR-150H AND IR-170S

PART NO.	DESCRIPTION	TIP DIA. (in.)	TIP ANGLE	MILBAR® REF#
FOR MODEL IR-120H AND IR-120S PLIERS (both pliers use same tips)				
IR-120T	1 Pair w/ screws	.120	0°	7801R
IR-124T	1 Pair w/ screws	.120	45°	7845R
IR-129T	1 Pair w/ screws	.120	90°	7890R
FOR MODEL IR-150H PLIERS				
IR-150T	1 Pair w/ screws	.150	0°	71001R
IR-154T	1 Pair w/ screws	.150	45°	71451R
IR-159T	1 Pair w/ screws	.150	90°	71901R
FOR MODEL IR-170S PLIERS				
IR-170T	1 Pair w/ screws	.170	0°	68001R
IR-174T	1 Pair w/ screws	.170	45°	68451R
IR-179T	1 Pair w/ screws	.170	90°	68901R



IR-120H INTERNAL



IR-120S EXTERNAL



IR-150H INTERNAL



IR-170S EXTERNAL

RETAINING RING PLIERS REFERENCE GUIDE

PART NO.	DESCRIPTION	TIP DIA. (in.)	TIP ANGLE	RING TYPE		TIP STYLE		GRIPS	SPRING	STOP	RATCHET LOCK	MILBAR® REF#
				Int. (Housing)	Ext. (Shaft)	FIXED	REPLACE.					
INDUSTRIAL PLIERS												
IR-2184R	Mini Industrial (NSN 5120-00-024-9527)	.023	45°		●	●			●			2184R
IR-2129R	Mini Industrial	.023	90°		●	●			●			2129R
IR-2159R	Mini Industrial	.023	90°		●	●			●			2159R
IR-2189R	Mini Industrial (NSN 5120-00-024-9528)	.023	90°		●	●			●			2189R
IR-250H	Industrial Pliers (NSN 5120-00-596-8665)	.025	0°	●		●		●	●	●		101R
IR-2545H	Industrial Pliers	.025	45°	●		●		●	●	●		10145R
IR-2590H	Industrial Pliers (NSN 5120-00-024-9531)	.025	90°	●		●		●	●	●		10190R
IR-380S	Industrial Pliers (NSN 5120-00-288-9717)	.038	0°		●	●		●	●	●		2R
IR-380H	Industrial Pliers (NSN 5120-00-293-0048)	.038	0°	●		●		●	●	●		1R
IR-3845S	Industrial Pliers (NSN 5120-00-288-9716)	.038	45°		●	●		●	●	●		245R
IR-3845H	Industrial Pliers	.038	45°	●		●		●	●	●		145R
IR-3890S	Industrial Pliers (NSN 5120-00-408-1434)	.038	90°		●	●		●	●	●		290R
IR-3890H	Industrial Pliers	.038	90°	●		●		●	●	●		190R
IR-470S	Industrial Pliers	.047	0°		●	●		●	●	●		202R
IR-470H	Industrial Pliers	.047	0°	●		●		●	●	●		102R
IR-4745S	Industrial Pliers	.047	45°		●	●		●	●	●		20245R
IR-4745H	Industrial Pliers	.047	45°	●		●		●	●	●		10245R
IR-4790S	Industrial Pliers	.047	90°		●	●		●	●	●		20290R
IR-700S	Industrial Pliers (NSN 5120-00-293-0049)	.070	0°		●	●		●	●	●		4R
IR-700H	Industrial Pliers (NSN 5120-00-293-0045)	.070	0°	●		●		●	●	●		3R
IR-7045S	Industrial Pliers (NSN 5120-00-640-6352)	.070	45°		●	●		●	●	●		445R
IR-7045H	Industrial Pliers (NSN 5120-00-801-0957)	.070	45°	●		●		●	●	●		345R
IR-7090S	Industrial Pliers (NSN 5120-00-024-9529)	.070	90°		●	●		●	●	●		490R
IR-7090H	Industrial Pliers (NSN 5120-00-595-9532)	.070	90°	●		●		●	●	●		390R
IR-900H	Industrial Pliers (NSN 5120-00-293-0046)	.090	0°	●		●		●	●	●		5R
IR-9045H	Industrial Pliers (NSN 5120-00-520-9863)	.090	45°	●		●		●	●	●		545R
IR-9090H	Industrial Pliers (NSN 5120-00-602-4845)	.090	90°	●		●		●	●	●		590R
IR-1150S	Industrial Pliers (NSN 5120-00-293-0047)	.115	0°		●	●		●	●			66R
IR-11590S	Industrial Pliers (NSN 5120-00-892-5919)	.115	90°		●	●		●	●			6690R
UTILITY PLIERS												
IR-250HU	Utility Pliers (NSN 5120-00-596-1106)	.025	0°	●		●						2101R
IR-2545HU	Utility Pliers (NSN 5120-00-640-6357)	.025	45°	●		●						210145R
IR-2590HU	Utility Pliers	.025	90°	●		●						210190R
IR-380HU	Utility Pliers (NSN 5120-00-293-2514)	.038	0°	●		●						21R
IR-380SU	Utility Pliers (NSN 5120-00-292-2513)	.038	0°		●	●						22R
IR-3845HU	Utility Pliers (NSN 5120-00-640-6356)	.038	45°	●		●						2145R
IR-3845SU	Utility Pliers (NSN 5120-00-640-6353)	.038	45°		●	●						2245R
IR-3890HU	Utility Pliers	.038	90°	●		●						2190R
IR-3890SU	Utility Pliers (NSN 5120-00-752-9755)	.038	90°		●	●						2290R
IR-470HU	Utility Pliers	.047	0°	●		●						2102R
IR-4745HU	Utility Pliers	.047	45°	●		●						210245R
IR-4745SU	Utility Pliers	.047	45°		●	●						220245R
IR-4790HU	Utility Pliers	.047	90°	●		●						210290R
IR-4790SU	Utility Pliers	.047	90°		●	●						220290R
IR-700HU	Utility Pliers (NSN 5120-00-596-0711)	.070	0°	●		●						23R
IR-700SU	Utility Pliers (NSN 5120-00-595-9555)	.070	0°		●	●						24R
IR-7045HU	Utility Pliers (NSN 5120-00-640-6355)	.070	45°	●		●						2345R
IR-7045SU	Utility Pliers	.070	45°		●	●						2445R
IR-7090HU	Utility Pliers	.070	90°	●		●						2390R
IR-7090SU	Utility Pliers	.070	90°		●	●						2490R
IR-90HU	Utility Pliers (NSN 5120-00-595-0554)	.090	0°	●		●						25R
IR-9090HU	Utility Pliers (NSN 5120-00-793-5052)	.090	90°	●		●						2590R
IR-1150SU	Utility Pliers (NSN 5120-00-293-0044)	.115	0°		●	●						266R
IR-11545SU	Utility Pliers	.115	45°		●	●						26645R
LOCK RING PLIERS												
IR-15R	Small, Auto Transmission				●	●		●	●			15R
IR-47R	Standard (NSN 5120-00-595-9551)				●	●		●	●			47R
IR-48R	Thin Nose				●	●		●	●			48R
IR-601R	Auto Transmission				●	●		●	●			601R
IR-602R	Heavy Duty				●	●		●	●			602R
IR-LRRL	Lock Ring Pliers with Ratchet Lock, IR-47R Style Tips				●		●	●	●		●	2836R
IR-LRS	Lock Ring Pliers with IR-47R Style Tips				●		●	●	●			4936R

SHAFT/BORE DIAMETER & RING SERIES REFERENCE

CONVERTIBLE PLIERS									
	PLIERS PART NO. TIP ANGLE			TIP SIZE (in.)	SHAFT DIAMETER (in.)	HOUSING/BORE DIAMETER (in.)	RETAINING RING MFG / RING SERIES		
	0°	45°	90°				ROTOR CLIP®	TRUARC®	DASH NO.
FIXED TIPS	IR-38Q IR-3818C IR-38	IR-3845Q IR-3845	IR-3890Q IR-3890C IR-3890	.038	.250 to .672		SH, BSH	5100, 5101	-25 thru -66
					.500 to .781		SHI	5108	-50 thru -78
					.125 to .250		SHF	5555	-12 thru -25
						.375 to .562	HO, BHO	N5000, N5001	-37 thru -56
						.750 to 1	HOI	5008	-75 thru -100
	IR-47Q IR-4718C IR-47	IR-4745Q IR-4745	IR-4790Q IR-4790C IR-4790	.047	.687 to .875		SH, BSH	5100, 5101	-68 thru -87
					.812 to 1		SHI	5108	-81 thru -100
					.312, .375		SHF	5555	-31, -37
						.625 to 1.023	HO, BHO	N5000, N5001	-62 thru -102
						1 to 1.023	VHO	N5002	-100 thru -102
	IR-70Q IR-7018C IR-70	IR-7045Q IR-7045	IR-7090Q IR-7090C IR-7090	.070	.938 to 1.438		SH, BSH	5100, 5101	-93 thru -143
					1 to 1.438		VSH	5102	-100 thru -143
					1.062 to 2		SHI	5108	-106 thru -200
					.438 to .750		SHF	5555	-43 thru -75
						1.062 to 1.75	HO, BHO, VHO	N5000, N5001, N5002	-106 thru -175
	1.438 to 2	HOI	5008	-143 thru -200					
	IR-90Q IR-90	IR-9045Q IR-9045	IR-9090Q IR-9090	.090	1.5 to 3.5		SH, VSH	5100, 5102	-150 thru -350
					1.5 to 1.75		BSH	5101	-150 thru -175
					2.156 to 3.25		SHI	5108	-215 thru -325
						1.812 to 3	HO, VHO	N5000, N5002	-181 thru -300
2.062 to 3						HOI	5008	-206 thru -300	
UNIVERSAL CONVERTIBLE PLIERS									
REPLACEABLE TIPS	IR-92		IR-92	.038	.250 to .672		SH, BSH	5100, 5101	-25 thru -66
					.500 to .781		SHI	5108	-50 thru -78
					.125 to .250		SHF	5555	-12 thru -25
						.375 to .562	HO, BHO	N5000, N5001	-37 thru -56
						.750 to 1	HOI	5008	-75 thru -100
	IR-92		IR-92	.047	.687 to .875		SH, BSH	5100, 5101	-68 thru -87
					.812 to 1		SHI	5108	-81 thru -100
					.312, .375		SHF	5555	-31, -37
						.625 to 1.023	HO, BHO	N5000, N5001	-62 thru -102
						1 to 1.023	VHO	N5002	-100 thru -102
	IR-92		IR-92	.047		1.062 to 1.375	HOI	5008	-106 thru -137
	IR-92		IR-92	.070	.938 to 1.438		SH, BSH	5100, 5101	-93 thru -143
					1 to 1.438		VSH	5102	-100 thru -143
					1.062 to 2		SHI	5108	-106 thru -200
					.438 to .750		SHF	5555	-43 thru -75
						1.062 to 1.75	HO, BHO, VHO	N5000, N5001, N5002	-106 thru -175
	1.438 to 2	HOI	5008	-143 thru -200					

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SHAFT/BORE DIAMETER & RING SERIES REFERENCE

FIXED TIP PLIERS									
	PLIERS PART NO. TIP ANGLE			TIP SIZE (in.)	SHAFT DIAMETER (in.)	HOUSING/BORE DIAMETER (in.)	RETAINING RING MFG / RING SERIES		
	0°	45°	90°				ROTOR CLIP®	TRUARC®	DASH NO.
MINI	IR-230S	IR-2124R	IR-2129R	.023	.125		SH, BSH, VSH	5100, 5101, 5102	-12
	IR-0015R	IR-2154R	IR-2159R		.156				-15
	IR-0018R	IR-2184R	IR-2189R		.188 to .236				-18 thru -23
INDUSTRIAL	IR-250H	IR-2545H	IR-2590H	.025		.250 to .312	HO, BHO, VHO	N5000, N5001, N5002	-25 thru -31
	IR-380H	IR-3845H	IR-3890H	.038		.375 to 1.023	HO, BHO, VHO	N5000, N5001, N5002	-37 thru -102
						.750 to 1.375	HOI	5008	-75 thru -137
	IR-380S	IR-3845S	IR-3890S	.038	.250 to .875		SH, BSH, VSH	5100, 5101, 5102	-25 thru -87
					.500 to 1.0		SHI	5108	-50 thru -100
					.125 to .250		SHF	5555	-12 thru -25
	IR-470H	IR-4745H		.047		.625 - 1.023	HO, BHO	N5000, N5001	-62 thru -102
						1 - 1.023	VHO	N5002	-100 thru -102
						1.062 - 1.375	HOI	5008	-106 thru -137
	IR-470S	IR-4745S	IR-4790S	.047	.687 - .875		SH, BSH	5100, 5101	-68 thru -87
					.812 - 1		SHI	5108	-81 thru 100
					.312, .375		SHF	5555	-31, -37
	IR-700H	IR-7045H	IR-7090H	.070		1.062 to 1.750	HO, BHO, VHO	N5000, N5001, N5002	-106 thru -175
						1.437 to 2.000	HOI	5008	-143 thru -200
	IR-700S	IR-7045S	IR-7090S	.070	.938 to 1.438		SH, BSH, VSH	5100, 5101, 5102	-93 thru -143
					1.062 to 2.000		SHI	5108	-106 thru -200
					.312 to .625		SHF	5555	-31 thru -62
	IR-900H	IR-9045H	IR-9090H	.090		1.812 to 3.500	HO, VHO	N5000, N5002	-181 thru -350
						2 to 3	HOI	5008	-200 thru -300
	IR-1150S		IR-11590S	.115	1.500 to 3.500		SH, BSH, VSH	5100, 5101, 5102	-150 thru -350
					2.125 to 3.25		SHI	5108	-215 thru -325
					.750		SHF	5555	-75
UTILITY	IR-250HU	IR-2545HU	IR-2590HU	.025		.250 to .312	HO, BHO, VHO	N5000, N5001, N5002	-25 thru -31
	IR-380HU	IR-3845HU	IR-3890HU	.038		.375 to 1.023	HO, BHO, VHO	N5000, N5001, N5002	-37 thru -102
						.750 to 1.375	HOI	5008	-75 thru -137
	IR-380SU	IR-3845SU	IR-3890SU	.038	.250 to .875		SH, BSH, VSH	5100, 5101, 5102	-25 thru -87
					.500 to 1.0		SHI	5108	-50 thru -100
					.125 to .250		SHF	5555	-12 thru -25
	IR-470HU	IR-4745HU	IR-4790HU	.047		.625 - 1.023	HO, BHO	N5000, N5001	-62 thru -102
						1 - 1.023	VHO	N5002	-100 thru -102
						1.062 - 1.375	HOI	5008	-106 thru -137
		IR-4745SU	IR-4790SU	.047	.687 - .875		SH, BSH	5100, 5101	-68 thru -87
					.812 - 1		SHI	5108	-81 thru 100
					.312, .375		SHF	5555	-31, -37
	IR-700HU	IR-7045HU	IR-7090HU	.070		1.062 to 1.750	HO, BHO, VHO	N5000, N5001, N5002	-106 thru -175
						1.437 to 2.000	HOI	5008	-143 thru -200
	IR-700SU	IR-7045SU	IR-7090SU	.070	.938 to 1.438		SH, BSH, VSH	5100, 5101, 5102	-93 thru -143
					1.062 to 2.000		SHI	5108	-106 thru -200
					.312 to .625		SHF	5555	-37 thru -62
	IR-90HU		IR-9090HU	.090		1.812 to 3.500	HO, VHO	N5000, N5002	-181 thru -350
						2 to 3	HOI	5008	-200 thru -300
	IR-1150SU	IR-11545SU		.115	1.500 to 3.500		SH, BSH, VSH	5100, 5101, 5102	-150 thru -350
					2.125 to 3.25		SHI	5108	-215 thru -325
					.750		SHF	5555	-75
REPLACEABLE TIP PLIERS									
SMALL	IR-44K KIT	IR-44H				.375 to 1.750	HO, BHO, VHO	N5000, N5001, N5002	-37 thru -175
		IR-44S			.250 to 1.438	.750 to 2	HOI	5008	-75 thru -200
					.500 to 2		SH, BSH, VSH	5100, 5101, 5102	-25 thru -143
HEAVY DUTY	IR-50K KIT	IR-50H		.108		2.438 to 3.125	HO, VHO	N5000, N5002	-244 thru -312
						2.625 to 3	HOI	5008	-262 thru -300
				.120		3.156 to 4.250	HO, VHO	N5000, N5002	-315 thru -425
						3.156 to 4	HOI	5008	-315 thru -400
		IR-50S		.108	1.500 to 3.500		SH	5100	-150 thru -350
					2.125 to 3.500		BSH	5101	-150 thru -175
					1.562 to 3.750		SHI	5108	-215 thru -350
				.120	3.500 to 3.939		SH	5100	-156 thru -375
							SHI	5108	-350 thru -393
LARGE	IR-120H	IR-12045H	IR-12090H	.120		3.062 to 6	HO	N5000	-306 thru -600
						3.156 to 4	HOI	5008	-315 thru -400
	IR-120S	IR-12045S	IR-12090S	.120	3.543 to 6.500		SH	5100	-354 thru -650
EXTRA LARGE					3.500 to 4		SHI	5108	-350 thru -400
	IR-150H	IR-15045H	IR-15090H	.150		6.250 to 10	HO, VHO	N5000, N5002	-625 thru -1000
	IR-170S	IR-17045S	IR-17090S	.170	6.750 to 9.500		SH, VSH	5100, 5102	-675 thru -950

*Rotor Clip® and Truarc® are registered trademarks of Rotor Clip Company, Inc.

MILBAR® WIRE TWISTERS

The world's leading brand of Wire Twister Tools and Kits, Milbar® Wire Twisters are designed for the professional mechanic. Milbar forgings are made from high carbon alloy steel and are controlled throughout the manufacturing process to exacting engineering specifications. Each tool passes a series of rigorous quality assurance tests which ensure function and reliability under the most demanding environments.

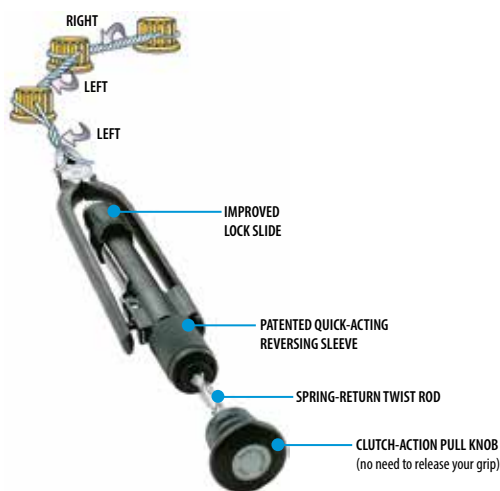
TYPES AND STYLES

Milbar Wire Twisters come in three nominal sizes: 6", 9" and 12". Some models incorporate a Cushion Throat to catch clipped wire ends, preventing FOD (foreign object damage). The Spring Return feature automatically retracts the twist rod to ease and speed the work. Finally, Milbar Wire Twisters can produce right-hand twists (clockwise action), left-hand twists or both (reversible action).



REVERSIBLE WIRE TWISTERS

- Reversible action for left and right twists.
- Automatic spring return.
- Faster with better control.
- Selected models available with cushion throat to hold clipped wire – no Foreign Object Damage (FOD).



Cushion throat catches clipped wire ends.



REVERSIBLE

PART NO.	DESCRIPTION	NOM. SIZE (in.)	RETURN	TWIST	NOSE	JAW
25W	SafetyTwist®	6	Auto	Reversible	Diagonal	Cushion Throat
45W	SafetyTwist®	6	Auto	Reversible	Diagonal	Standard
26W	SafetyTwist®	9	Auto	Reversible	Diagonal	Cushion Throat
41W	SafetyTwist®	9	Auto	Reversible	Diagonal	Standard
42W	SafetyTwist®	12	Auto	Reversible	Diagonal	Standard

Conforms to ASME
Standard B107.500-2010

AUTOMATIC RETURN

- Spring return feature automatically retracts the twist rod to ease and speed the work.
- Cushion throat available in 9" model: catches clipped wire ends; prevents FOD.
- Right-hand twist (6", 9", 12") or left-hand twist (9", 12").

1W393



11W



3W6



2W393



Cushion Throat prevents
foreign object damage



AUTO RETURN

PART NO.	DESCRIPTION	NOM. SIZE (in.)	RETURN	TWIST	NOSE	JAW
11W	SafetyTwist®	6	Auto	Right Hand	Diagonal	Standard
1W393	SafetyTwist®	9	Auto	Right Hand	Diagonal	Standard
3W6	SafetyTwist®	9	Auto	Right Hand	Diagonal	Cushion Throat
5W4	SafetyTwist®	9	Auto	Left Hand	Diagonal	Standard
2W393	SafetyTwist®	12	Auto	Right Hand	Diagonal	Standard
6W4	SafetyTwist®	12	Auto	Left Hand	Diagonal	Standard

Conforms to ASME
Standard B107.500-2010

MANUAL RETURN

- Manual return models combine full performance with economy – for the infrequent user.
- Cushion throat available in 9" model: catches clipped wire ends; prevents FOD.
- Right-hand twist (6", 9", 12") or left-hand twist (9", 12").



13W SPECIALTY TWISTER

- For difficult access situations (i.e., deep reach or close quarters).
- Adjustable 13" to 19".
- Right-hand twist.
- Manual return.



MANUAL RETURN

PART NO.	DESCRIPTION	NOM. SIZE (in.)	RETURN	TWIST	NOSE	JAW
30W	SafetyTwist®	6	Manual	Right Hand	Diagonal	Standard
1W	SafetyTwist®	9	Manual	Right Hand	Diagonal	Standard
3W5	SafetyTwist®	9	Manual	Right Hand	Diagonal	Cushion Throat
5W6	SafetyTwist®	9	Manual	Left Hand	Diagonal	Standard
2W	SafetyTwist®	12	Manual	Right Hand	Diagonal	Standard
6W6	SafetyTwist®	12	Manual	Left Hand	Diagonal	Standard
13W	Long Reach 13"–19" Adjustable	19	Manual	Right Hand		

Conforms to ASME
Standard B107.500-2010

KITS

105W Professional Safety Wiring Kit.
The most versatile kit available. Contains three different SafetyTwist® Pliers to cover almost any application: 9" Automatic (1W393), 6" Mini (11W) and a 19" Deep Reach Twister (13W). Includes three 1/4 lb. spools of stainless steel safety wire (.020", .032", .041"). Durable plastic storage case. Kit weight 4 lbs. NSN 5180-90-986-8939.

109W Limited Access Safety Wiring Kit.
Contains the 6" Mini (11W) for general purpose wiring and work in close quarters, and the 19" Deep Reach Twister (13W) for special applications. Includes three 1/4 lb. spools of stainless steel safety wire (.020", .032", .041"). Durable plastic storage case. Kit weight 2 lbs. 12 oz. NSN 5180-01-337-9841.



105W



109W

STAINLESS STEEL SAFETY LOCKWIRE

- Conforms to ASTM A580-S30400-Cond.A.
- Conforms to Military Specification NASM20995(MS20995 C).
- Available in 5 different wire diameters.
- 1 lb. center core dispensers or 1/4 lb. spools.

All Safety Lockwire is made from Stainless Type 304 Steel

SAFETY WIRE

PART NO.	WIRE DIA. (in.)	SIZE	WIRE LENGTH (ft.)
14WA	.020	1/4 lb. Spool	234
15WA	.032	1/4 lb. Spool	91
16WA	.041	1/4 lb. Spool	55
17WA	.020	1 lb. Dispenser	937
18WA	.025	1 lb. Dispenser	599
19WA	.032	1 lb. Dispenser	366
20WA	.041	1 lb. Dispenser	223
21WA	.051	1 lb. Dispenser	144



1 LB. CENTER CORE DISPENSER

1/4 LB. SPOOLS

SAFETY WIRE INSTALLATION HIGHLIGHTS, DOUBLE TWIST METHOD:

(AEROSPACE STANDARD AS567)

1. The safety wire is installed so that, if the fastener has any tendency to loosen, it will cause the safety wire to tighten.
2. The maximum span of safety wire (between tension points) shall be 6" (152 mm).
3. The maximum length of safety wire to be used in a single application is 24" (609 mm).
4. The number of twists per inch (1 twist = 1/2 complete turn) depends upon wire diameter: 0.020" to 0.025" dia., 8-14 twists; 0.032" to 0.041" dia., 6-11 twists; 0.051" to 0.060" dia., 4-9 twists.
5. The wire which is looped around the outside of the fastener must always be routed UNDER the wire protruding from the hole (so that the loop will stay down and not cause slack). This often requires the direction of the wrap and twist of strands to REVERSE from run to run, or run to pigtail.
6. Pigtail should be no more than 3/4" long and have a minimum of four (4) twists. Ends should be cut and bent toward fastener to prevent snags.

SPECIFICATIONS



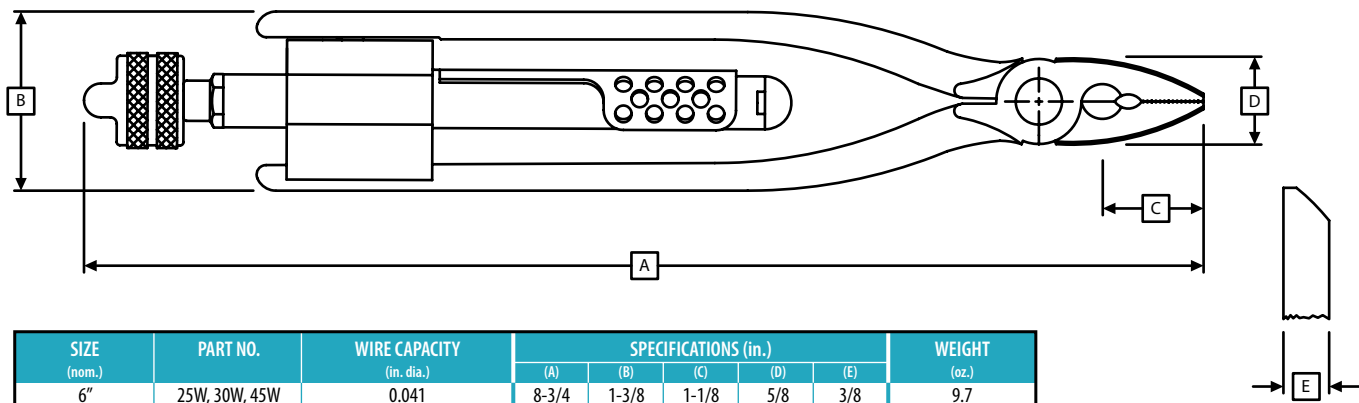
DIAGONAL



CUSHION THROAT



DEEP REACH



SIZE (nom.)	PART NO.	WIRE CAPACITY (in. dia.)	SPECIFICATIONS (in.)					WEIGHT (oz.)
			(A)	(B)	(C)	(D)	(E)	
6"	25W, 30W, 45W	0.041	8-3/4	1-3/8	1-1/8	5/8	3/8	9.7
	ALL OTHERS	0.041	8-3/8	1-3/8	1-1/8	5/8	3/8	8.3
9"	26W, 41W	0.060	11	1-3/4	1-9/16	13/16	7/16	14.0
	ALL OTHERS	0.060	10-1/2	1-3/4	1-9/16	13/16	7/16	12.9
12"	42W	0.060	12-1/4	2	1-9/16	13/16	7/16	14.6
	ALL OTHERS	0.060	11-7/8	2	1-9/16	13/16	7/16	14.0

QUICK REFERENCE GUIDE

PART NO.	DESCRIPTION	NOM. LENGTH (in.)	RETURN		TWIST			NOSE		JAW	
			AUTO	MANUAL	RIGHT	LEFT	REVERSIBLE	DIAGONAL	TAPERED	STD.	CUSHION THROAT
11W	SafetyTwist®	6	•		•			•		•	
25W	SafetyTwist®	6	•				•	•			•
30W	SafetyTwist®	6		•	•			•		•	
45W	SafetyTwist®	6	•				•	•		•	
1W	SafetyTwist®	9		•	•			•		•	
1W393	SafetyTwist®	9	•		•			•		•	
3W5	SafetyTwist®	9		•	•			•			•
3W6	SafetyTwist®	9	•		•			•			•
41W	SafetyTwist®	9	•				•	•		•	
5W4	SafetyTwist®	9	•			•		•		•	
5W6	SafetyTwist®	9		•		•		•		•	
26W	SafetyTwist®	9	•				•	•			•
2W	SafetyTwist®	12		•	•			•		•	
2W393	SafetyTwist®	12	•		•			•		•	
42W	SafetyTwist®	12	•				•	•		•	
6W4	SafetyTwist®	12	•			•		•		•	
6W6	SafetyTwist®	12		•		•		•		•	
13W	Long Reach	19		•	•						
105W	Professional Safety Wiring Kit One each: 11W, 1W393, 13W, 14WA, 15WA, 16WA										
109W	Limited Access Safety Wiring Kit One each: 11W, 13W, 14WA, 15WA, 16WA										

OIL FILTER WRENCHES

ADJUSTABLE OIL FILTER WRENCHES

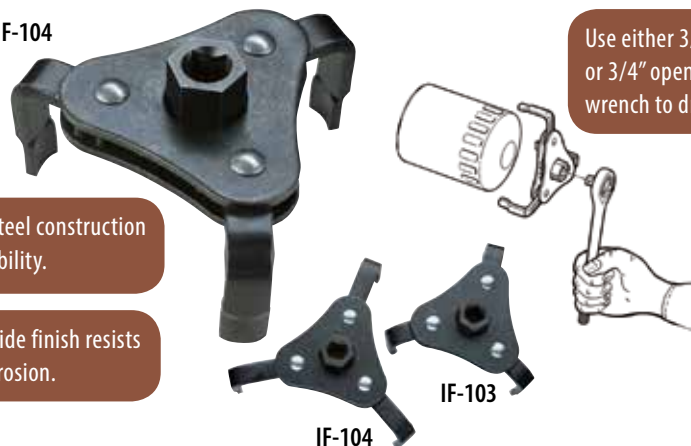
- Self-adjusting heavy-duty design actually grabs onto the filter and automatically tightens.
- Ideal for removal of most spin-off oil, fuel and fuel-water separators.
- Use either 3/8" ratchet or 3/4" open-end wrench to drive.
- Low profile (2-1/2" high) for easy access in confined areas.
- Withstands over 85 ft.-lbs. of torque to remove stubborn filters.
- Sure-grip three-point contact.
- Smooth-moving sprocket gears eliminate jamming.
- Fits hundreds of filters!

IF-104

Sturdy steel construction for durability.

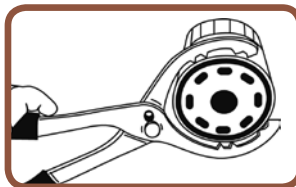
Black oxide finish resists rust/corrosion.

Use either 3/8" ratchet or 3/4" open-end wrench to drive.



IF-101 OIL FILTER PLIERS

- Quick fit, easy removal tool for ALL popular filters size 62 to 110 mm.
- Slipjoint, solid construction allows fit to a wider filter range.
- Easy access in tight spots.
- For all makes of cars and light trucks.
- Cushion grips for comfort.
- Nom. length 9".



IF-101



The quick fit, easy removal tool for all makes of cars and light trucks.

PART NO.	DESCRIPTION
IF-101	Oil Filter Pliers 62 mm – 110 mm
IF-103	Adjustable Oil Filter Wrench 62 mm – 93 mm (2-1/2" – 3-3/4")
IF-104	Adjustable Oil Filter Wrench 62 mm – 121 mm (2-1/2" – 4-3/4")

OIL FILTER CUP WRENCHES

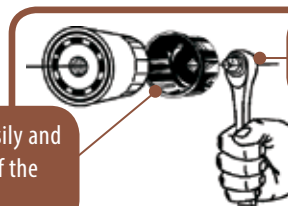
- Glass-reinforced engineered composite material.
- Provides high torque capacity:
 - Handles 140 ft.-lbs. of torque to remove even the most stubborn filters.
 - Competitive plastic cup wrenches don't even come close to this torque capacity.
- Metal Drive Insert will not deform or break even after years of service.
- Each tool acts like a socket to remove hard-to-reach or stubborn oil filters.
- 100% USA-made.
- Use with 3/8" drive or with extensions to reach difficult filters; protects mechanic from hot oil contact.
- Will not crush filter can or cause oil spillage and cleanup expense.
- Extensive application charts available.
- Special carded packaging allows customers to actually test their oil filter with the packaged wrench without opening cartons or complicated blister packs.

Handles up to 140 ft.-lbs. of torque to remove even the most stubborn filters!



The wrench fits easily and firmly to the end of the oil filter.

Attach a standard 3/8" drive to your wrench.

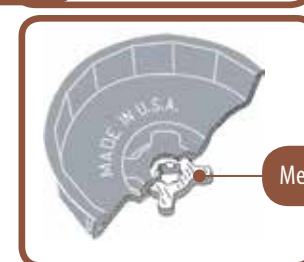


Metal Drive Insert

PART NO.	DESCRIPTION
IF-6567C	65/67 mm, 14 Flute ("B"cup)
IF-7476C	74/76 mm, 15 Flute ("I"cup)
IF-7614C	76 mm, 14 Flute ("J"cup)
IF-7693C	76/80/93 mm, 36 Flute ("Z"cup)
IF-9315C	93 mm, 15 Flute ("Q"cup)
IF-SKITC	5 - Piece Kit, one each size



IF-SKITC



ENGINE TOOLS

ET-109 AIR OPERATED VALVE SPRING COMPRESSOR

Fast operating, fully controlled "C" type valve lifter that compresses the heaviest springs in a fraction of a second. Controlled release action is a must when keys or keepers are being replaced. Operates with online pressure of 90-100 lbs. and develops pressure equal to three times the line pressure. Features a completely paralleled lift that will not bend valve stem. Ideal for all late model cars, trucks, buses, tractors, marine and industrial engines. Furnished with three sets of quick-change jaws. Replacement jaws available. Maximum opening: 8-1/2". Throat depth: 9-1/2".



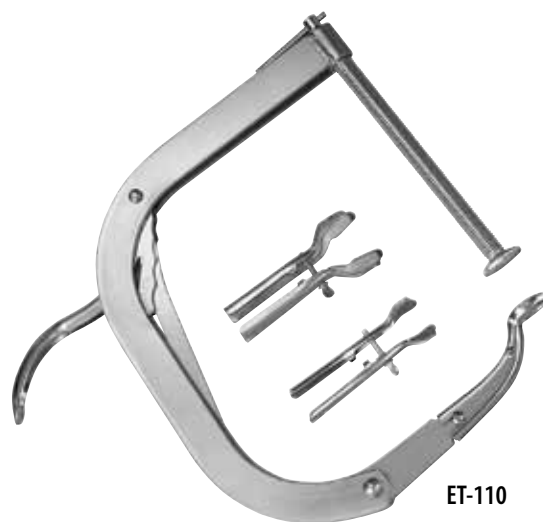
ET-109

ET-107 AIR OPERATED VALVE SPRING COMPRESSOR FOR LARGE ENGINES

Same features as ET-109, but in a larger frame size. Maximum opening: 10". Throat depth: 11". Includes three sets of quick-change jaws and a special longer length valve spring adapter. Replacement jaws available.

ET-110 UNIVERSAL VALVE SPRING COMPRESSOR

Use for 1" to 2-1/4" spring diameters. Maximum opening: 9-1/2". Throat depth: 9". Universal type. Designed for use on automotive, truck, tractor and marine "L" head and valve-in head engines. Sure, one-hand control lock and release. Spring release frees other hand for replacing keepers or locks on valve stem. Quickly adjusts for any valve stem length. One simple adjustment with pin-operated screw on the first set of valves sets clamp for the balance of the springs. Heavy-duty cam-locking handle gives powerful leverage for handling the stiffest of springs. Full thread length on screw adjusting post provides maximum capacity. Complete with three sets of rugged, spring handling, quick-change jaws ranging from 7/8" to 2-1/2". Replacement jaws available.



ET-110

ET-111 PARALLEL LIFT VALVE SPRING COMPRESSOR

Equipped for 1" to 2" spring diameters. Maximum opening: 8-1/2". Throat depth: 9". Designed for use on automotive, truck, tractor, bus and marine "L" head and valve-in head engines. Vertical lift type prevents bending of valve stem. Spring release frees other hand for easy replacement of keepers or locks on valve stem. Quickly adjusts for any valve stem length. One simple adjustment with the pin-operated screw on the first set of valves sets clamp for the balance of springs. Heavy-duty cam-locking handle gives powerful leverage for handling the stiffest of springs. Equipped with one pair of medium offset quick-change jaws. Replacement jaws available.



ET-111

ENGINE TOOLS

ET-104 OVERHEAD CAM VALVE SPRING COMPRESSOR

- Specifically designed for overhead cam engines.
- The adjustable cam action provides a parallel lift. The operating handle automatically locks after compressing the valve spring leaving the hands free to remove the keepers.
- The tool also fits a wide variety of small and medium O.H.V. engines.
- Maximum opening: 5-1/4"; throat depth: 5-1/2".



QUICK CHANGE JAWS

- Change jaws in seconds!
- Use on all models of Imperial Valve Spring Compressors (except ET-104 Overhead Cam Valve Spring Compressor).

1. Loosen 2 screws.
2. Slide jaws off the frame.
3. Slip replacement jaws on.
4. Tighten the same 2 screws.

PART NO.	DESCRIPTION
ET-104	Overhead Cam Valve Spring Compressor
ET-107	Air Operated Valve Spring Compressor for Large Engines
ET-109	Air Operated Valve Spring Compressor
ET-110	Universal Valve Spring Compressor
ET-111	Parallel Lift Valve Spring Compressor
7121103	Small Straight Jaws: 7/8" - 1-7/8"
7121104	Medium Offset Jaws: 1" - 2"
7121105	Large Straight Jaws: 1-1/2" - 2-1/2"



ALPHA-NUMERICAL INDEX

PART NO.	PAGE NO.	PART NO.	PAGE NO.	PART NO.	PAGE NO.	PART NO.	PAGE NO.	PART NO.	PAGE NO.	PART NO.	PAGE NO.
IR-4790T.....	64	IR-51245T.....	64	S62661.....	22	S8485201.....	9	TM500P.....	80		
IR-5004TK.....	64	IR-51290T.....	64	S62666.....	22	S8487001.....	9	TM500S.....	80		
IR-5108TK.....	64	IR-477045K.....	59	S62835.....	10	S8694401.....	15	U7001.....	47		
IR-5120T.....	64	IR-477090K.....	59	S62836.....	10	S8711201.....	15	U7002.....	47		
IR-5120TK.....	64	IR-LHS.....	63, 64	S62837.....	10	S8771301.....	15	U7005.....	47		
IR-7018C.....	57	IR-LRRL.....	63	S64104.....	33, 34	S8771601.....	15	U7006.....	47		
IR-7045.....	59	IR-LRS.....	63	S64108.....	33, 34	S8771701.....	15	U7009.....	47		
IR-7045H.....	60	KCK-F.....	40	S64870.....	33, 34	S8771801.....	15	U7010.....	47		
IR-7045HU.....	60	KCK-M.....	40	S66434.....	22	S8920071.....	40				
IR-7045Q.....	58	LD-900.....	49	S66435.....	22	S8920072.....	40				
IR-7045S.....	60	LD-910.....	49	S66914.....	9	S8920073.....	40				
IR-7045SU.....	60	LD-920.....	49	S68479.....	9	S8920074.....	40				
IR-7090.....	59	LT100BNR.....	80	S68480.....	9	S8920077.....	40				
IR-7090C.....	57	LT POSTERSET.....	80	S68481.....	9	S8920263.....	40				
IR-7090H.....	60	LTWD1.....	80	S68492.....	9	S8921626.....	38				
IR-7090HU.....	60	PT-109.....	41	S68493.....	9	S10000265.....	38				
IR-7090Q.....	58	S26883.....	2, 3	S68496.....	9	S10000770.....	3				
IR-7090S.....	60	S32633.....	2, 3	S68497.....	9	S16002045.....	41				
IR-7090SU.....	60	S38600.....	16	S68502.....	9	S16003162.....	1, 3				
IR-9045.....	59	S62156.....	9	S69021.....	33, 34	TB-52.....	23, 79				
IR-9045H.....	60	S62255.....	10	S70348.....	15	TC-1000.....	1				
IR-9045Q.....	58	S62287.....	10	S70349.....	15	TC-1010.....	1				
IR-9090.....	59	S62289.....	10	S71174.....	22	TC-1020.....	1				
IR-9090H.....	60	S62290.....	10	S74197.....	3	TC-1050.....	2				
IR-9090HU.....	60	S62291.....	10	S74761.....	3	TC-1050RH.....	2				
IR-9090Q.....	58	S62292.....	10	S74762.....	2, 3	TC-1051.....	2				
IR-9345T.....	64	S62294.....	10	S74833.....	3	TC-2050.....	2				
IR-9390T.....	64	S62295.....	10	S74834.....	3	TC-3050.....	2				
IR-10815T.....	64	S62296.....	10	S75015.....	1, 2, 3	TC-3050RH.....	2				
IR-10845T.....	64	S62297.....	10	S75046.....	1, 3	TC-3051.....	2				
IR-10890T.....	64	S62298.....	10	S75531.....	18	TE-BA01.....	43				
IR-11545SU.....	60	S62299.....	10	S76548.....	33, 34	TE-BA0145.....	43				
IR-11590S.....	60	S62300.....	10	S76637.....	1, 3	TE-BV01-3.....	38				
IR-12045H.....	62	S62301.....	10	S77511.....	3	TE-BV01B.....	38				
IR-12045S.....	62	S62302.....	10	S5951125.....	40	TE-BV01R.....	38				
IR-12090H.....	62	S62303.....	10	S7931801.....	3	TE-BV01Y.....	38				
IR-12090S.....	62	S62304.....	10	S7958301.....	38	TE-BV02-3.....	38				
IR-15045H.....	62	S62305.....	10	S7958302.....	38	TE-BV02B.....	38				
IR-15090H.....	62	S62306.....	10	S8058801.....	9	TE-BV02R.....	38				
IR-17045S.....	62	S62307.....	10	S8058901.....	9	TE-BV02Y.....	38				
IR-17090S.....	62	S62641.....	22	S8201501.....	3	TH-103.....	80				
IR-47700K.....	59	S62648.....	22	S8230301.....	35	TM400P.....	80				
IR-51215T.....	64	S62655.....	22	S8442401.....	9	TM400S.....	80				

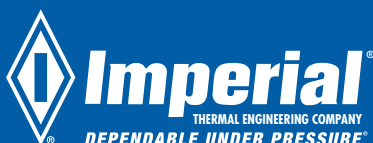


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