

***One Direct Source for all your
Water Blasting Parts and Accessories!***

SURFACE NOZZLES	PAGE
Standard with Carbide Blade	1
Button Tip	1
TLX	1
Fan Tip Nozzles	1
TUBE NOZZLES	PAGE
Monroe-Jet Orbital Nozzles	2
Pineapple Line Moles	2
Sapphire Orifice Nozzles	3-4
Nozzle Flow Charts	5-7
FITTINGS	PAGE
Quick Disconnect Couplings	8
Autoclave Style	8
20K Gland Nuts	8
20K Collars	8
20K Plugs	8
20K Hose Couplings	8
20K Tube Adapters	8
20K Slimline Couplings	9

LANCES & RELATED	PAGE
Rigid Lances	10
Stingers & Pipe Nipples	10
Rigid Lance Holder	11
Flex Lance Safety Grips	11
Flex Lance Safety for Tube Mount	12
CONTROL GUNS	PAGE
9/16" MP Hand Held Dump Guns	14
9/16" MP Hand Held Double Dump Guns	14
9/16" Zero-Thrust Hand Guns	15
Foot Operated Dump Guns	16
ACCESSORIES	PAGE
Air Operated Dump Valves	17
Flow Divider Valve	18
PRV and Gauge Board	19
Water blasting Pressure Gauges	21
Lubricants, Sealants & Tapes	25
SAFETY ACCESSORIES	PAGE
Whip Checks	22
Rupture Disc Holder w/Safety Shroud, Rupture Discs	22
Gun Whip Hoses with Safety Shrouds	21
TurtleSkin High Pressure WaterArmor for Safety	23
Conditions of Sale & Warranty	26

20K NOZZLES

20K TLX Nozzles The APS stainless steel TLX Nozzles come in pressure ratings to match your flex or rigid lances. The 20K-TLX have Autoclave-type MP threads. All have wrench flats for easy installation on the lance. All offer many options for 3 or 4 rows of precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-TLX MP	Dimensions
16-004-001	16-004-101	1/4" MP	.375" OD x 1.375" L
16-005-001	16-005-101	3/8" MP	.468" OD x 1.650" L
16-006-001	16-006-101	9/16" MP	.687" OD x 2.063" L



20K MP Male Standard Nozzles The 20K-MP Male Standard Nozzle is designed to go with flex or rigid lances with either right or left hand Autoclave-type medium pressure threads, a special seating design with wrench flats for easy installation, and offer a wide range of options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-MP-M	Dimensions
16-020-004	16-020-001	1/4"-28 MP (M)	.375" OD x 1.250" L
16-020-005	16-020-002	3/8"-24 MP (M)	.500" OD x 1.500" L
16-020-006	16-020-003	9/16"-18 MP (M)	.625" OD x 1.625" L

Part ID	Description	Dimensions
16-020-009	BLANK, BALL TYPE, 13MM TYPE M	(20K MAWP) X 1-1/8" DIA. X 1-3/4" LONG NOZZLE



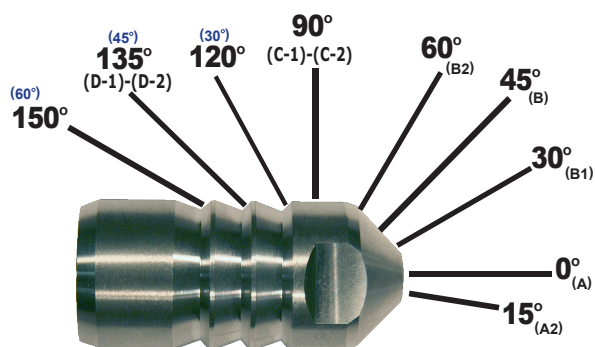
20K Standard Nozzles with Tungsten Carbide Blade The APS tungsten carbide tipped tube nozzles are to be used in rotary applications for the removal of hardened plugs in heat exchanger tubes. Please specify drilling pattern, pressure and flow when ordering.



RH Part #	20K-MP-M	Dimensions
16-001-221	1/4" MP RH	.375" OD x 1.225" L
16-002-221	3/8" MP RH	.468" OD x 1.375" L
16-003-221	9/16" MP RH	.750" OD x 1.625" L

Typical Tube Nozzle Drill Patterns

Please specify drilling pattern, pressure and flow when ordering.



Use this handy reference when designing your customized drilled orifice locations. If you have any questions, call our highly experienced staff.

20K MP Standard Nozzles The economical APS stainless steel MP Standard style nozzles come in pressure ratings to match your flex or rigid lances. The 20K-MP Standard Nozzle is designed to go with lances with either right or left hand Autoclave-type medium pressure threads, a special seating design that eliminates the requirement for gland nuts and collars, wrench flats for easy installation, and offer a wide range of options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-MP STD.	Dimensions
16-001-001	16-001-101	1/4" MP	.375" OD x 1.225" L
16-002-001	16-002-101	3/8" MP	.468" OD x 1.375" L
16-003-001	16-003-101	9/16" MP	.687" OD x 1.625" L
16-010-001	16-010-101	3/4" MP	1.00" OD x 1.875" L



20K Button Tip Nozzles APS Button-Tip compact stainless steel nozzles are ideal for cleaning small diameter tubes with small radius bends. The 20K-BT have Autoclave-type MP threads, and offer many options for precision drilled orifices. Please specify drilling pattern, pressure and flow when ordering.

LH Part #	RH Part #	20K-BT MP	Dimensions
16-007-001	16-007-101	1/4" MP	.375" OD x 0.875" L
16-008-001	16-008-101	3/8" MP	.468" OD x 1.000" L
16-009-001	16-009-101	9/16" MP	.687" OD x 1.125" L
16-021-001	16-021-101	3/4" MP	1.00" OD x 1.375" L



20K Control Gun Nozzle Holders for Drop-In Nozzles APS makes its quick-change 9/16" MP (F) Nozzle Holders for control guns to accommodate the TC Drop-In Tips (below) common to shotgun cleaning applications. Simply unscrew the cap and drop in the appropriate nozzle for the job.

Part #	Description
17-025-000	9/16" MP Nozzle Holder Assembly, Complete
17-025-001	Cap, 9/16" MP Nozzle Holder
17-025-002	Body, 9/16" MP Nozzle Holder
30-001-010	O-Ring, 9/16" MP Nozzle Holder, 2-010 Buna-N



20K Drop-In Tungsten Carbide Fan Tip Nozzles The APS TC Drop-In Fan-Tip Nozzles are compact inserts made to drop into the typical quick-change nozzle holder body common to shotgun cleaning applications.



Please specify orifice size, pressure and flow when ordering.

Part #	Jet Size	Part #	Jet Size
17-026-021	0.021"	17-026-047	0.047"
17-026-024	0.024"	17-026-051	0.051"
17-026-026	0.026"	17-026-055	0.055"
17-026-028	0.028"	17-026-059	0.059"
17-026-031	0.031"	17-026-062	0.062"
17-026-036	0.036"	17-026-067	0.067"
17-026-041	0.041"	17-026-075	0.075"
17-026-043	0.043"		

20K Drop-In Tungsten Carbide Hard Hitter Nozzles The APS TC Drop-In Hard-Hitter Nozzles are compact inserts made to drop into the typical quick-change nozzle holder body common to shotgun cleaning applications.



Please specify orifice size, pressure and flow when ordering.

Part #	Jet Size	Part #	Jet Size
17-025-021	0.021"	17-025-043	0.043"
17-025-024	0.024"	17-025-047	0.047"
17-025-026	0.026"	17-025-051	0.051"
17-025-028	0.028"	17-025-055	0.055"
17-025-031	0.031"	17-025-059	0.059"
17-025-036	0.036"	17-025-062	0.062"
17-025-041	0.041"	17-025-076	0.076"

20K APLM Pineapple Line Mole Nozzles The APS APLM pineapple-type line mole nozzles are made from stainless steel with a special copper coating to prevent galling during installation. APLM nozzles have 9/16 and 9/16 to 3/4" NPT inlets with 1/4" or 3/8" NPT (F) ports, and a choice of port locations. These are used with line mole inserts listed on the next page. Wrench flats allow for easy installation.



Part ID	Description	PSI/Bar
16-025-001	NOZZLE, 20K STANDARD PINEAPPLE (3/4" MPF INLET X 1/2"-28 FMS PORTS) 1@A, 3@B(45° FORWARD), 6@C(0° RADIAL), 6@D(45° BACK)	20K/1379
16-025-002	NOZZLE, 20K SPECIAL PINEAPPLE (3/4" MPF INLET X 1/2"-28 FMS PORTS) 3@B(45° FORWARD), 4@C(0° RADIAL), 4@D(45° BACK)	20K/1379
16-025-003	NOZZLE, SP-3/4" MP LH PINEAPPLE (1 @ A, 2-1/4"-28 PORTS @ B @ 60°, 2-1/4"-28 PORTS @ C @ 90°, 2-1/4"-28 PORTS @ D @ 45° (1-5/8" DIA.)	20K/1379
16-025-004	NOZZLE, SP-3/4" MP LH PINEAPPLE (1 @ A, 3-3/8"-24 JEWEL PORTS @ B @ 45°, 6-3/8"-24 JEWEL PORTS @ C @ 90° (2-3/4" DIA.)	20K/1379
16-025-005	NOZZLE, SP-3/4" MP LH 20K EA No PINEAPPLE (4-1/4"-28 PORTS @ B @ 60°, 4-1/4"-28 PORTS @ C @ 90°, 4-1/4"-28 PORTS @ D @ 45° (1-5/8" DIA.)	20K/1379
16-025-006	NOZZLE, SP-3/4" MP LH 20K PINEAPPLE (4-3/8"-24 JEWEL PORTS @ B @ 60°, 4-3/8"-24 JEWEL PORTS @ C @ 90°, 4-3/8"-24 JEWEL PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-007	NOZZLE, SP-3/4" MP LH 20K PINEAPPLE (4-3/8"-24 PORTS @ B @ 30°, 4-3/8"-24 PORTS @ C @ 90°, 4-3/8"-24 PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-009	NOZZLE, SP-9/16" MP (13/16"-16 RHF) 20K PINEAPPLE (4-1/16" NPTF PORTS @ C1 @ 15° FWD., 4-1/16" NPTF PORTS @ C2 @ 15° FWD. MIS-ALIGNED, (1-1/4" DIA.)	20K/1379
16-025-010	NOZZLE, SP-9/16" MPF (13/16"-16 RHF) 20K PINEAPPLE (2-1/4" NPTF PORTS @ C @ 90°, 4-1/4" NPTF PORTS @ D @ 45° ALIGNED, (2-1/4" DIA. X 4-1/2" LONG)	20K/1379
16-025-020	NOZZLE, SP-9/16" MP (F) 20K ROUNDED PINEAPPLE (2 PORTS @ C2 @ 20° BACK, 2-1/4" NPT PORTS @ C1 @ 20° BACK) (1-1/2" DIA. X 2.875 LONG)	20K/1379
16-025-107	NOZZLE, SP-9/16" HP LH 20K PINEAPPLE (4-3/8"-24 PORTS @ B @ 30°, 4-3/8"-24 PORTS @ C @ 90°, 4-3/8"-24 PORTS @ D (45°) (2-3/4" DIA.)	20K/1379
16-025-112	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-3/8"-24 RH JETS @ A2 @ 75° FWD.), 4-3/8"-24 RH JETS @ B (45° FWD.) (2-3/4" DIA.)	20K/1379
16-025-116	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-1/4"-28 RH JETS @ A2 @ 75° FWD., 4-1/4"-28 RH JETS @ B @ 45° FWD.) (1-9/16" DIA.)	20K/1379
16-025-117	NOZZLE, SP-9/16" MP LH 20K PINEAPPLE (2-3/8"-24 RH JETS @ A2 @ 75° FWD., 4-3/8"-24 RH JETS @ B @ 45° FWD.) (1-15/16" DIA.)	20K/1379
16-025-119	BAR, SP-9/16" HP RH 40K SPRAY (4-1/4"-28 RH JETS @ 30° INC., 2-1/4"-28 RH JETS @ 90°) (6-1/4" DIA.) (TAPPED HOLE FOR HC 090 PULLING RING)	20K/1379

20K Monroe-Jet Orbital Nozzles APS proudly offers the Monroe-Jet orbital nozzles in a wide variety of flows and pressure ratings to suit your application. 9/16"-18 RH and M14 x 1.5LH inlet threads are available upon request. Please specify orifice size and flow when ordering.



Part #	Description/Orifice	PSI / Flow
16-201-035	Repair Kit - .035"/0.90 mm	20K @ 4.7 GPM
16-201-043	Repair Kit - .043"/1.10 mm	20K @ 7.0 GPM
16-201-045	Repair Kit - .045"/1.15 mm	20K @ 7.7 GPM
16-201-049	Repair Kit - .049"/1.25 mm	20K @ 9.1 GPM
16-201-051	Repair Kit - .051"/1.30 mm	20K @ 9.8 GPM
16-201-061	Repair Kit - .061"/1.55 mm	20K @ 14.0 GPM
16-201-063	Repair Kit - .063"/1.60 mm	20K @ 14.9 GPM
16-201-075	Repair Kit - .075"/1.90 mm	20K @ 21.0 GPM

Part #	Description / Connection	PSI / Flow	Orifice
16-200-024	Type F1 / 9/16"-18 LH	20K @ 2.0 GPM	.024"/.60 mm
16-200-026	Type F1 / 9/16"-18 LH	20K @ 2.5 GPM	.026"/.65 mm
16-200-028	Type F1 / 9/16"-18 LH	20K @ 2.9 GPM	.028"/.70 mm
16-200-030	Type F1 / 9/16"-18 LH	20K @ 3.3 GPM	.030"/.75 mm
16-200-031	Type F1 / 9/16"-18 LH	20K @ 3.7 GPM	.031"/.80 mm
16-200-033	Type F1 / 9/16"-18 LH	20K @ 4.2 GPM	.033"/.85 mm
16-200-035	Type F1 / 9/16"-18 LH	20K @ 4.7 GPM	.035"/.90 mm
16-200-037	Type F1 / 9/16"-18 LH	20K @ 5.3 GPM	.037"/.95 mm
16-200-039	Type F1 / 9/16"-18 LH	20K @ 5.8 GPM	.039"/1.0 mm
16-200-041	Type F1 / 9/16"-18 LH	20K @ 6.4 GPM	.041"/1.05 mm
16-200-043	Type F1 / 9/16"-18 LH	20K @ 7.0 GPM	.043"/1.10 mm
16-200-045	Type F1 / 9/16"-18 LH	20K @ 7.7 GPM	.045"/1.15 mm
16-200-047	Type F1 / 9/16"-18 LH	20K @ 8.4 GPM	.047"/1.20 mm
16-200-049	Type F1 / 9/16"-18 LH	20K @ 9.1 GPM	.049"/1.25 mm
16-200-051	Type F1 / 9/16"-18 LH	20K @ 9.8 GPM	.051"/1.30 mm
16-200-053	Type F1 / 9/16"-18 LH	20K @ 10.6 GPM	.053"/1.35 mm
16-200-055	Type F1 / 9/16"-18 LH	20K @ 11.4 GPM	.055"/1.40 mm
16-200-057	Type F1 / 9/16"-18 LH	20K @ 12.2 GPM	.057"/1.45 mm
16-200-059	Type F1 / 9/16"-18 LH	20K @ 13.1 GPM	.059"/1.50 mm
16-200-061	Type F1 / 9/16"-18 LH	20K @ 14.0 GPM	.061"/1.55 mm
16-200-063	Type F1 / 9/16"-18 LH	20K @ 14.9 GPM	.063"/1.60 mm
16-200-065	Type F1 / 9/16"-18 LH	20K @ 15.8 GPM	.065"/1.65 mm
16-200-067	Type F1 / 9/16"-18 LH	20K @ 16.8 GPM	.067"/1.70 mm

20K NOZZLES

20K Patented High-Performance Sapphire Orifice Assemblies The APS High-Performance Sapphire Nozzle Assemblies are compact inserts made to screw into the most typical UHP rotary nozzle holder bodies common to UHP cleaning applications.

Part #	Jet Size
17-001-000	PLUG
17-001-007	0.007"
17-001-008	0.008"
17-001-009	0.009"
17-001-010	0.010"
17-001-011	0.011"
17-001-012	0.012"
17-001-013	0.013"
17-001-014	0.014"
17-001-015	0.015"
17-001-016	0.016"
17-001-017	0.017"
17-001-018	0.018"
17-001-019	0.019"
17-001-020	0.020"
17-001-021	0.021"
17-001-022	0.022"
17-001-023	0.023"
17-001-024	0.024"
17-001-025	0.025"
17-001-026	0.026"

Part #	Jet Size
17-001-027	0.027"
17-001-028	0.028"
17-001-029	0.029"
17-001-031	0.031"
17-001-034	0.034"
17-001-035	0.035"
17-001-036	0.036"
17-001-037	0.037"
17-001-038	0.038"
17-001-039	0.039"
17-001-040	0.040"
17-001-043	0.043"
17-001-050	0.050"
17-001-051	0.051"
17-001-052	0.052"
17-001-056	0.056"
17-002-007	0.007"
17-002-008	0.008"
17-002-009	0.009"
17-002-010	0.010"
17-002-011	0.011"

Part #	Jet Size
17-002-012	0.012"
17-002-013	0.013"
17-002-014	0.014"
17-002-015	0.015"
17-002-016	0.016"
17-002-017	0.017"
17-002-018	0.018"
17-002-019	0.019"
17-002-020	0.020"
17-002-021	0.021"
17-002-022	0.022"
17-002-023	0.023"
17-002-025	0.025"
17-002-028	0.028"
17-002-029	0.029"
17-002-031	0.031"
17-002-033	0.033"
17-002-034	0.034"
17-002-035	0.035"
17-002-036	0.036"

All are 3/8"-24 RH. The 17-002 part series is stat-tested.

Please specify orifice size, pressure and flow when ordering.



20K High-Performance Sapphire Insert Assemblies The APS High-Performance Sapphire Nozzle Inserts are compact inserts made to drop into the typical nozzle jewel screw common to UHP jetting applications.

17-006 Series is screw-type and
17-010 Series is slotted-type.



**17-010
Slotted-Type
M4x.5**

Slotted Part #	Jet Size
17-010-100	JEWEL SCREW SLOTTED
17-006-001	SLEEVE
17-010-100	PLUG ASSY SLOTTED
17-010-008	0.008"
17-010-009	0.009"
17-010-010	0.010"
17-101-011	0.011"
17-101-012	0.012"
17-101-013	0.013"
17-101-014	0.014"
17-101-015	0.015"
17-101-016	0.016"
17-101-017	0.017"
17-101-018	0.018"
17-101-019	0.019"
17-101-020	0.020"

Slotted Part #	Jet Size
17-101-021	0.021"
17-101-022	0.022"
17-101-023	0.023"
17-101-024	0.024"
17-101-025	0.025"
17-101-026	0.026"
17-101-027	0.027"
17-101-028	0.028"
17-101-029	0.029"
17-101-030	0.003"
17-101-031	0.031"
17-101-032	0.032"
17-101-033	0.033"
17-101-034	0.034"
17-101-035	0.035"
17-101-036	0.036"

Slotted Part #	Jet Size
17-101-037	0.037"
17-101-038	0.038"
17-101-039	0.039"
17-101-040	0.040"
17-101-041	0.041"
17-101-042	0.042"
17-101-043	0.043"
17-101-044	0.044"
17-101-045	0.045"
17-101-046	0.046"
17-101-047	0.047"
17-101-048	0.048"
17-101-049	0.049"
17-101-050	0.050"
17-101-051	0.051"
17-101-052	0.052"

Screw Part #	Jet Size
17-006-000	JEWEL SCREW HEX
17-006-001	SLEEVE
17-006-112	PLUG ASSY HEX
17-006-008	0.008"
17-006-009	0.009"
17-006-010	0.010"
17-006-011	0.011"
17-006-012	0.012"
17-006-013	0.013"
17-006-014	0.014"
17-006-015	0.015"
17-006-016	0.016"
17-006-017	0.017"
17-006-018	0.018"
17-006-019	0.019"
17-006-020	0.020"

Screw Part #	Jet Size
17-006-021	0.021"
17-006-022	0.022"
17-006-023	0.023"
17-006-024	0.024"
17-006-025	0.025"
17-006-026	0.026"
17-006-027	0.027"
17-006-028	0.028"
17-006-029	0.029"
17-006-030	0.003"
17-006-031	0.031"
17-006-032	0.032"
17-006-033	0.033"
17-006-034	0.034"
17-006-035	0.035"
17-006-036	0.036"

Screw Part #	Jet Size
17-006-037	0.037"
17-006-038	0.038"
17-006-039	0.039"
17-006-040	0.040"
17-006-041	0.041"
17-006-042	0.042"
17-006-043	0.043"
17-006-044	0.044"
17-006-045	0.045"
17-006-046	0.046"
17-006-047	0.047"
17-006-048	0.048"
17-006-049	0.049"
17-006-050	0.050"
17-006-051	0.051"
17-006-052	0.052"

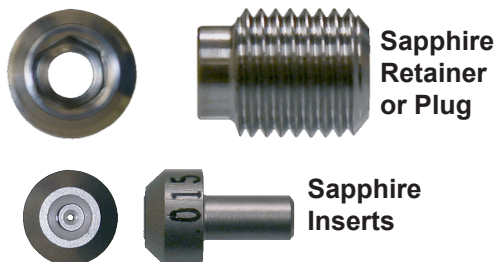


**17-006
Hex-Type
M4x.5**

Please specify orifice size, pressure and flow when ordering.

20K High-Performance Sapphire Orifice Insert The APS High-Performance Sapphire Orifice Nozzle Inserts are compact inserts made to drop into the typical nozzle jewel screw common to UHP jetting applications.

Please specify orifice size, pressure and flow when ordering.



Part #	Jet Size	Part #	Jet Size
17-003-000	PLUG	17-003-020	0.020"
17-003-001	RETAINER	17-003-021	0.021"
17-003-007	0.007"	17-003-022	0.022"
17-003-008	0.008"	17-003-025	0.025"
17-003-009	0.009"	17-003-026	0.026"
17-003-010	0.010"	17-003-027	0.027"
17-003-011	0.011"	17-003-028	0.028"
17-003-012	0.012"	17-003-031	0.031"
17-003-013	0.013"	17-003-032	0.032"
17-003-014	0.014"	17-003-033	0.033"
17-003-015	0.015"	17-003-034	0.034"
17-003-016	0.016"	17-003-035	0.035"
17-003-018	0.018"	17-003-036	0.036"
17-003-019	0.019"	17-003-038	0.038"

20K Turbo Nozzles The APS Turbo Nozzles provide the most thorough cleaning of tube walls with maximum impact without streaking. This nozzle also integrates, backward-facing orifices that propel them through hard deposits on the I.D. of pipes and tubes. At the same time, part of the nozzle rotates and polishes the pipe's I.D. We offer custom flow rates for your special applications. Turbo nozzle or blanks are used to cap the end of the nozzle (sold separately). Parts that are worn can be replaced in the field within five minutes with a simple rebuild kit to minimizing downtime.



Part #15-072-001
Turbo Nozzle Assembly 7/16" w/15-065-003



Part #15-071-001
Turbo Nozzle Assembly 3/8" w/15-065-002



Part #15-070-001
Turbo Nozzle Assembly 1/8" w/15-065-001

Select an assembly and corresponding blank, replacement sleeves and assembly bodies also available.

PART ID	Pressure	Turbo Nozzles and Spare Sleeves/Bodies	Nozzle Blank	Diameter
15-070-001		TURBO NOZZLE ASSY, 1/4" MP RH #1 FLOW RATE BODY & SLEEVE (J/S TYPE: 52018) (3.8 GPM's @20K)	15-065-001	0.375
15-070-003	20K	BODY, 1/4" MP RH TURBO NOZZLE (20K MAWP)		
15-070-004		SLEEVE, 1/4" MP #1 TURBO NOZZLE (J/S TYPE: 51956)		
15-070-011	20K	TURBO NOZZLE ASSY, 1/4" MP LH #1 FLOW RATE BODY & SLEEVE (J/S TYPE: 52018-LH) (3.8 GPM'S @ 20K)	15-065-001	0.375
15-070-013		BODY, 1/4" MP LH TURBO NOZZLE (20K MAWP)		
15-070-004		SLEEVE, 1/4" MP #1 TURBO NOZZLE (J/S TYPE: 51956)		
15-071-001		TURBO NOZZLE ASSY, 3/8" MP RH #1 FLOW RATE BODY & SLEEVE (J/S TYPE: 52021) (5.7 GPM's @20K)	15-065-002	0.5
15-071-003	20K	BODY, 3/8" MP RH TURBO NOZZLE (20K MAWP)		
15-071-004		SLEEVE, 3/8" MP #1 TURBO NOZZLE (J/S TYPE: 51958)		
15-071-011		TURBO NOZZLE ASSY, 3/8" MP LH #1 FLOW RATE BODY & SLEEVE (J/S TYPE: 52021) (5.7 GPM's @20K)	15-065-002	
15-071-013		BODY, 3/8" MP LH TURBO NOZZLE (20K MAWP)		
15-071-005		SLEEVE, 3/8" MP #1 TURBO NOZZLE (J/S TYPE: 51958)		
15-072-001		TURBO NOZZLE ASSY, 9/16" RH MP #1 FLOW RATE BODY & SLEEVE (8.5 GPM's @20K)	15-065-003	0.75
15-072-003	20K	BODY, 9/16" MP RH TURBO NOZZLE (20K MAWP)		
15-072-004		SLEEVE, 9/16" MP #1 TURBO NOZZLE (J/S TYPE: 52551)		
15-072-002		TURBO NOZZLE ASSY, 9/16" MP RH #2 FLOW RATE BODY & SLEEVE (14.6 GPM's @20K)	15-065-003	0.75
15-072-003	20K	BODY, 9/16" MP RH TURBO NOZZLE (20K MAWP)		
15-072-005		SLEEVE, 9/16" MP #2 TURBO NOZZLE (J/S TYPE: 54256)		
15-072-011		TURBO NOZZLE ASSY, 9/16" LH MP #1 FLOW RATE BODY & SLEEVE (8.5 GPM's @20K)	15-065-003	0.75
15-072-013	20K	BODY, 9/16" MP LH TURBO NOZZLE (20K MAWP)		
15-072-004		SLEEVE, 9/16" MP #1 TURBO NOZZLE (J/S TYPE: 52551)		
15-072-012		TURBO NOZZLE ASSY, 9/16" LH MP #2 FLOW RATE BODY & SLEEVE (14.6 GPM's @20K)	15-065-003	0.75
15-072-013	20K	BODY, 9/16" MP LH TURBO NOZZLE (20K MAWP)		
15-072-005		SLEEVE, 9/16" MP #2 TURBO NOZZLE (J/S TYPE: 54256)		

Nozzle Number	Orifice Diam./In.	2,000 PSI	4,000 PSI	5,000 PSI	6,000 PSI	7,000 PSI	8,000 PSI	9,000 PSI
0.12	0.012	0.154	0.218	0.244	0.267	0.288	0.308	0.327
0.13	0.013	0.181	0.256	0.286	0.313	0.338	0.362	0.384
0.14	0.014	0.210	0.297	0.332	0.363	0.392	0.419	0.445
0.15	0.015	0.241	0.340	0.381	0.417	0.450	0.481	0.511
0.16	0.016	0.274	0.387	0.433	0.474	0.512	0.548	0.581
0.18	0.018	0.347	0.490	0.548	0.600	0.649	0.693	0.735
0.2	0.020	0.428	0.605	0.677	0.741	0.801	0.856	0.908
0.21	0.021	0.472	0.667	0.746	0.817	0.883	0.944	1.001
0.22	0.022	0.518	0.732	0.819	0.897	0.969	1.036	1.099
0.24	0.024	0.616	0.872	0.974	1.067	1.153	1.233	1.307
0.25	0.025	0.669	0.946	1.057	1.158	1.251	1.337	1.419
0.26	0.026	0.723	1.023	1.144	1.253	1.353	1.447	1.534
0.28	0.028	0.839	1.186	1.326	1.453	1.569	1.678	1.780
0.31	0.031	1.028	1.454	1.626	1.781	1.924	2.057	2.181
0.32	0.032	1.096	1.550	1.732	1.898	2.050	2.191	2.324
2	0.036	1.387	1.961	2.193	2.402	2.594	2.773	2.942
3	0.043	1.978	2.798	3.128	3.427	3.701	3.957	4.197
4	0.047	2.364	3.343	3.737	4.094	4.422	4.727	5.014
4.5	0.050	2.675	3.783	4.229	4.633	5.004	5.350	5.674
5	0.052	2.893	4.092	4.575	5.011	5.413	5.786	6.137
5.5	0.055	3.237	4.577	5.118	5.606	6.055	6.473	6.866
6	0.059	3.725	5.267	5.889	6.451	6.968	7.449	7.901
6.5	0.060	3.852	5.447	6.090	6.672	7.206	7.704	8.171
7	0.062	4.113	5.817	6.503	7.124	7.695	8.226	8.725
7.5	0.065	4.521	6.393	7.148	7.830	8.457	9.041	9.590
8	0.067	4.803	6.793	7.594	8.319	8.986	9.606	10.189
8.5	0.069	5.094	7.204	8.055	8.823	9.530	10.188	10.806
9	0.071	5.394	7.628	8.528	9.342	10.091	10.788	11.442
9.5	0.073	5.702	8.064	9.016	9.876	10.667	11.404	12.096
10	0.075	6.019	8.512	9.516	10.425	11.260	12.037	12.768
10.5	0.077	6.344	8.972	10.031	10.988	11.868	12.688	13.458
11	0.078	6.510	9.206	10.293	11.275	12.179	13.020	13.809
11.5	0.080	6.848	9.684	10.828	11.861	12.811	13.696	14.527
12	0.082	7.195	10.175	11.376	12.461	13.460	14.389	15.262
12.5	0.084	7.550	10.677	11.937	13.077	14.124	15.100	16.016
13	0.085	7.731	10.933	12.223	13.390	14.463	15.461	16.399
14	0.089	8.475	11.986	13.401	14.680	15.856	16.951	17.979
15	0.093	9.254	13.088	14.632	16.029	17.313	18.509	19.631
16	0.095	9.657	13.657	15.268	16.726	18.066	19.313	20.485
18	0.100	10.700	15.132	16.918	18.533	20.018	21.400	22.698
20	0.106	12.022	17.002	19.009	20.823	22.492	24.045	25.503
21	0.109	12.713	17.978	20.100	22.019	23.783	25.425	26.967
25	0.118	14.898	21.070	23.557	25.805	27.873	29.797	31.604
27	0.125	16.719	23.644	26.434	28.957	31.278	33.437	35.465
30	0.130	18.083	25.573	28.591	31.320	33.830	36.166	38.359
35	0.140	20.972	29.659	33.159	36.324	39.235	41.943	44.488
40	0.156	26.039	36.825	41.172	45.101	48.715	52.078	55.237
50	0.167	29.841	42.201	47.183	51.686	55.827	59.682	63.302
60	0.187	37.416	52.915	59.160	64.807	70.000	74.833	79.372
70	0.203	44.093	62.357	69.717	76.371	82.491	88.186	93.536
80	0.210	47.186	66.732	74.608	81.729	88.278	94.373	100.098
90	0.219	51.318	72.574	81.140	88.885	96.007	102.635	108.861
100	0.250	66.874	94.574	105.737	115.829	125.110	133.748	141.862

Nozzle Number	Orifice Diam./In.	10,000 PSI	15,000 PSI	20,000 PSI	25,000 PSI	30,000 PSI	36,000 PSI	40,000 PSI
0.12	0.012	0.345	0.422	0.487	0.545	0.597	0.654	0.689
0.13	0.013	0.404	0.495	0.572	0.639	0.700	0.767	0.809
0.14	0.014	0.469	0.574	0.663	0.741	0.812	0.890	0.938
0.15	0.015	0.538	0.659	0.761	0.851	0.932	1.021	1.077
0.16	0.016	0.612	0.750	0.866	0.968	1.061	1.162	1.225
0.18	0.018	0.775	0.949	1.096	1.226	1.343	1.471	1.550
0.2	0.020	0.957	1.172	1.353	1.513	1.658	1.816	1.914
0.21	0.021	1.055	1.292	1.492	1.668	1.828	2.002	2.110
0.22	0.022	1.158	1.418	1.638	1.831	2.006	2.197	2.316
0.24	0.024	1.378	1.688	1.949	2.179	2.387	2.615	2.756
0.25	0.025	1.495	1.831	2.115	2.364	2.590	2.837	2.991
0.26	0.026	1.617	1.981	2.287	2.557	2.801	3.069	3.235
0.28	0.028	1.876	2.297	2.653	2.966	3.249	3.559	3.752
0.31	0.031	2.299	2.816	3.252	3.635	3.982	4.363	4.599
0.32	0.032	2.450	3.001	3.465	3.874	4.243	4.649	4.900
2	0.036	3.101	3.798	4.385	4.903	5.371	5.883	6.202
3	0.043	4.424	5.418	6.256	6.995	7.662	8.394	8.848
4	0.047	5.285	6.473	7.474	8.357	9.154	10.028	10.570
4.5	0.050	5.981	7.326	8.459	9.457	10.360	11.349	11.963
5	0.052	6.469	7.923	9.149	10.229	11.205	12.275	12.939
5.5	0.055	7.238	8.864	10.235	11.443	12.536	13.732	14.475
6	0.059	8.329	10.200	11.778	13.169	14.425	15.802	16.657
6.5	0.060	8.613	10.549	12.181	13.619	14.919	16.342	17.226
7	0.062	9.197	11.264	13.007	14.542	15.930	17.450	18.394
7.5	0.065	10.109	12.380	14.296	15.983	17.509	19.180	20.217
8	0.067	10.740	13.154	15.189	16.982	18.603	20.378	21.480
8.5	0.069	11.391	13.951	16.109	18.011	19.730	21.613	22.782
9	0.071	12.061	14.772	17.057	19.070	20.890	22.884	24.122
9.5	0.073	12.750	15.615	18.031	20.159	22.084	24.191	25.500
10	0.075	13.458	16.483	19.033	21.279	23.310	25.535	26.916
10.5	0.077	14.186	17.374	20.061	22.429	24.570	26.915	28.371
11	0.078	14.556	17.828	20.586	23.016	25.212	27.619	29.113
11.5	0.080	15.312	18.754	21.655	24.211	26.522	29.053	30.625
12	0.082	16.088	19.703	22.751	25.437	27.865	30.524	32.175
12.5	0.084	16.882	20.676	23.875	26.693	29.240	32.031	33.764
13	0.085	17.286	21.171	24.446	27.332	29.941	32.798	34.573
14	0.089	18.951	23.211	26.801	29.965	32.825	35.958	37.903
15	0.093	20.693	25.344	29.265	32.719	35.842	39.263	41.387
16	0.095	21.593	26.446	30.537	34.141	37.400	40.970	43.186
18	0.100	23.926	29.303	33.836	37.830	41.440	45.396	47.851
20	0.106	26.883	32.925	38.018	42.506	46.562	51.007	53.766
21	0.109	28.426	34.815	40.200	44.946	49.235	53.935	56.852
25	0.118	33.314	40.801	47.113	52.674	57.702	63.209	66.628
27	0.125	37.384	45.786	52.869	59.109	64.751	70.931	74.768
30	0.130	40.434	49.522	57.183	63.932	70.034	76.719	80.869
35	0.140	46.894	57.433	66.318	74.146	81.223	88.976	93.788
40	0.156	58.225	71.311	82.343	92.062	100.849	110.475	116.451
50	0.167	66.726	81.723	94.365	105.503	115.573	126.604	133.452
60	0.187	83.666	102.469	118.321	132.287	144.913	158.744	167.331
70	0.203	98.595	120.754	139.435	155.893	170.772	187.071	197.190
80	0.210	105.512	129.225	149.217	166.829	182.752	200.195	211.024
90	0.219	114.750	140.539	162.281	181.435	198.752	217.722	229.499
100	0.250	149.535	183.142	211.475	236.436	259.003	283.723	299.070

20K - TUNGSTEN NOZZLE FLOWS

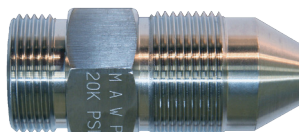
Nozzle Number	Orifice Diam./In.	2,000 PSI	4,000 PSI	5,000 PSI	6,000 PSI	7,000 PSI	8,000 PSI	9,000 PSI	10,000 PSI	15,000 PSI	20,000 PSI	25,000 PSI	30,000 PSI
0.15	0.015	0.291	0.412	0.460	0.504	0.544	0.582	0.617	0.651	0.797	0.920	1.029	1.127
0.16	0.016	0.331	0.468	0.524	0.573	0.619	0.662	0.702	0.740	0.907	1.047	1.171	1.282
0.18	0.018	0.419	0.593	0.663	0.726	0.784	0.838	0.889	0.937	1.148	1.325	1.482	1.623
0.2	0.020	0.517	0.732	0.818	0.896	0.968	1.035	1.097	1.157	1.417	1.636	1.829	2.004
0.21	0.021	0.570	0.807	0.902	0.988	1.067	1.141	1.210	1.275	1.562	1.804	2.017	2.209
0.22	0.022	0.626	0.885	0.990	1.084	1.171	1.252	1.328	1.400	1.714	1.980	2.213	2.424
0.24	0.024	0.745	1.054	1.178	1.290	1.394	1.490	1.580	1.666	2.040	2.356	2.634	2.885
0.25	0.025	0.808	1.143	1.278	1.400	1.512	1.617	1.715	1.807	2.214	2.556	2.858	3.131
0.26	0.026	0.874	1.236	1.382	1.514	1.636	1.749	1.855	1.955	2.394	2.765	3.091	3.386
0.28	0.028	1.014	1.434	1.603	1.756	1.897	2.028	2.151	2.267	2.777	3.206	3.585	3.927
0.29	0.029	1.088	1.538	1.720	1.884	2.035	2.175	2.307	2.432	2.979	3.440	3.846	4.213
0.31	0.031	1.243	1.758	1.965	2.153	2.325	2.486	2.637	2.779	3.404	3.930	4.394	4.814
0.32	0.032	1.324	1.873	2.094	2.294	2.478	2.649	2.809	2.961	3.627	4.188	4.682	5.129
2	0.036	1.676	2.370	2.650	2.903	3.136	3.352	3.556	3.748	4.590	5.300	5.926	6.492
2.1	0.039	1.967	2.782	3.110	3.407	3.680	3.934	4.173	4.399	5.387	6.221	6.955	7.619
2.2	0.040	2.069	2.926	3.272	3.584	3.871	4.139	4.390	4.627	5.667	6.544	7.316	8.014
2.3	0.041	2.174	3.075	3.438	3.766	4.067	4.348	4.612	4.861	5.954	6.875	7.687	8.420
3	0.043	2.391	3.382	3.781	4.142	4.474	4.783	5.073	5.347	6.549	7.562	8.455	9.262
4	0.047	2.857	4.040	4.517	4.948	5.345	5.714	6.061	6.388	7.824	9.035	10.101	11.065
4.5	0.050	3.233	4.573	5.112	5.600	6.049	6.467	6.859	7.230	8.855	10.225	11.432	12.523
4.7	0.051	3.364	4.757	5.319	5.827	6.293	6.728	7.136	7.522	9.213	10.638	11.893	13.029
5	0.052	3.497	4.946	5.530	6.057	6.543	6.994	7.419	7.820	9.577	11.059	12.364	13.544
5.5	0.055	3.912	5.533	6.186	6.776	7.319	7.825	8.299	8.748	10.714	12.372	13.832	15.152
6	0.059	4.502	6.367	7.118	7.798	8.423	9.004	9.550	10.067	12.329	14.237	15.917	17.437
6.5	0.060	4.656	6.585	7.362	8.064	8.711	9.312	9.877	10.411	12.751	14.724	16.461	18.033
7	0.062	4.972	7.031	7.861	8.611	9.301	9.943	10.546	11.117	13.615	15.721	17.577	19.255
7.5	0.065	5.464	7.728	8.640	9.465	10.223	10.929	11.592	12.219	14.965	17.280	19.319	21.163
8	0.067	5.806	8.211	9.180	10.056	10.862	11.612	12.316	12.982	15.900	18.359	20.527	22.486
8.5	0.069	6.158	8.708	9.736	10.665	11.520	12.315	13.062	13.769	16.863	19.472	21.770	23.848
9	0.071	6.520	9.220	10.309	11.292	12.197	13.039	13.830	14.578	17.855	20.617	23.051	25.251
9.5	0.073	6.892	9.747	10.897	11.938	12.894	13.784	14.621	15.411	18.875	21.795	24.368	26.693
10	0.075	7.275	10.288	11.503	12.601	13.610	14.550	15.433	16.267	19.923	23.006	25.721	28.176
10.5	0.077	7.668	10.844	12.124	13.282	14.346	15.336	16.267	17.147	21.000	24.249	27.111	29.699
11	0.078	7.869	11.128	12.441	13.629	14.721	15.737	16.692	17.595	21.549	24.883	27.820	30.475
11.5	0.080	8.277	11.706	13.088	14.337	15.485	16.555	17.559	18.509	22.668	26.175	29.265	32.058
12	0.082	8.696	12.299	13.750	15.063	16.269	17.393	18.448	19.446	23.816	27.500	30.746	33.681
12.5	0.084	9.126	12.906	14.429	15.806	17.073	18.252	19.359	20.406	24.992	28.858	32.264	35.344
13	0.085	9.344	13.215	14.775	16.185	17.482	18.689	19.822	20.895	25.591	29.549	33.037	36.190
14	0.089	10.244	14.488	16.198	17.744	19.166	20.489	21.732	22.907	28.056	32.396	36.220	39.677
15	0.093	11.186	15.819	17.687	19.375	20.927	22.372	23.729	25.013	30.634	35.373	39.549	43.323
16	0.095	11.672	16.507	18.456	20.217	21.837	23.345	24.761	26.100	31.966	36.911	41.268	45.207
18	0.100	12.933	18.290	20.449	22.401	24.196	25.867	27.436	28.920	35.419	40.899	45.726	50.091
20	0.106	14.532	20.551	22.977	25.170	27.187	29.064	30.827	32.494	39.797	45.954	51.378	56.282
25	0.118	18.008	25.468	28.474	31.191	33.691	36.017	38.202	40.268	49.318	56.947	63.669	69.746
27	0.125	20.208	28.579	31.952	35.002	37.806	40.417	42.868	45.187	55.343	63.904	71.447	78.267
30	0.130	21.857	30.911	34.559	37.858	40.891	43.715	46.366	48.874	59.859	69.119	77.277	84.653
35	0.140	25.349	35.849	40.081	43.906	47.424	50.699	53.774	56.683	69.422	80.162	89.623	98.178
40	0.156	31.475	44.512	49.766	54.516	58.884	62.949	66.768	70.379	86.197	99.531	****	****
50	0.167	36.070	51.010	57.031	62.475	67.480	72.140	76.516	80.654	98.781	****	****	****
60	0.187	45.227	63.960	71.509	78.335	84.611	90.453	80.654	****	****	****	****	****
70	0.203	53.297	75.373	84.270	92.313	99.710	95.940	****	****	****	****	****	****
80	0.210	57.036	80.661	90.182	98.789	****	****	****	****	****	****	****	****
90	0.219	62.030	87.723	98.077	****	****	****	****	****	****	****	****	****
100	0.250	80.833	****	****	****	****	****	****	****	****	****	****	****

20K Quick Disconnect Couplings APS designed its Quick-Disconnect Hose Couplings with all the best features seen in the market. They are made from heat-treated heavy duty stainless steel for high durability in water blasting service. Sizes available to suit most hoses.



Part #	Connection	PSI/Bar
21-025-001	9/16" MP Coupling Assembly	20K/1379
21-025-002	9/16" Female Half MP Screw Type	20K/1379
21-025-003	9/16" Male Half	20K/1379
21-025-004	9/16" NUT MP 3/4 Screw Type Coupling	20K/1379
21-025-005	9/16" Female Half Assembly	20K/1379
21-025-006	3/4" MP Coupling Assembly	20K/1379
21-025-007	3/4" Female Half MP Screw Type Coupling	20K/1379
21-025-008	3/4" Male Half	20K/1379
21-025-009	3/4" NUT MP Screw Type Coupling	20K/1379
21-025-010	3/4" Female Half Assembly	20K/1379
Part #	Repair Kits	PSI/Bar
30-008-010	9/16" T-Seal Repair Kit	20K/1379
30-008-012	3/4" T-Seal Repair Kit	20K/1379

Autoclave Style Single Piece Adaptors MP x Type M



Part #	Description	PSI/Bar
21-007-001	3/8" MP (M) x 5 MM (9/16"-18) Type M (M)	20K/1379
21-007-002	3/8" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379
21-007-003	9/16" MP (M) x 5 MM (9/16"-18) Type M (M)	20K/1379
21-007-004	9/16" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379
21-007-005	9/16" MP (M) x 13 MM (1"-12) Type M (M)	20K/1379
21-007-006	3/4" MP (M) x 5 MM (9/16"-18) Type M (M)	20K/1379
21-007-007	3/4" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379
21-007-008	3/4" MP (M) x 13 MM (1"-12) Type M (M)	20K/1379
21-007-009	1" MP (M) x 13 MM (1"-12) Type M (M)	20K/1379
21-007-010	1" MP (M) x 20 MM (1-5/16"-12) Type M (M)	20K/1379
21-007-034	9/16" MP (M) x 20 MM (1-5/16"-12) Type M (M)	20K/1379
21-007-037	3/4" MP (M) x 20 MM (1-5/16"-12) Type M (M)	20K/1379
21-007-044	3/4" MP (M) x 22 MM (7/8"-14) Type M (M)	20K/1379

Autoclave Style 90° MP Elbows

Part #	Description	PSI/Bar
21-009-001	1/4" MP	20K/1379
21-009-002	3/8" MP	20K/1379
21-009-003	9/16" MP	20K/1379
21-009-004	3/4" MP	20K/1379
21-009-005	1" MP	20K/1379



Autoclave Style Straight Couplings

Part #	Description	PSI/Bar
21-012-001	1/4" MP	20K/1379
21-012-002	3/8" MP	20K/1379
21-012-003	9/16" MP	20K/1379
21-012-004	3/4" MP	20K/1379
21-012-005	1" MP	20K/1379
21-012-006	1/4" MP x 3/8" MP	20K/1379
21-012-007	1/4" MP x 9/16" MP	20K/1379
21-012-008	3/8" MP x 9/16" MP	20K/1379
21-012-009	9/16" MP x 3/4" MP	20K/1379
21-012-010	3/4" MP x 1" MP	20K/1379



Autoclave Style Reducer Bushing With Gland Nut and Collar

Part #	Description	PSI/Bar
21-008-001	3/8" MP (M) x 1/4" MP (F)	20K/1379
21-008-002	9/16" MP (M) x 1/4" MP (F)	20K/1379
21-008-003	9/16" MP (M) x 3/8" MP (F)	20K/1379
21-008-004	9/16" MP (M) x 9/16" MP (F)	20K/1379
21-008-005	3/4" MP (M) x 3/8" MP (F)	20K/1379
21-008-006	3/4" MP (M) x 9/16" MP (F)	20K/1379
21-008-007	1" MP (M) x 9/16" MP (F)	20K/1379
21-008-008	1" MP (M) x 3/4" MP (F)	20K/1379
21-008-009	9/16" MP (M) x 1" MP (F)	20K/1379



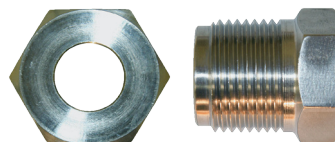
Autoclave Style Torpedo Adaptors MP x Type M

Part #	Description	PSI/Bar
21-007-011	3/4" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379
21-007-012	3/4" MP (M) x 13 MM (1"-12) Type M (M)	20K/1379
21-007-013	1" MP (M) x 13 MM (1"-12) Type M (M)*	20K/1379
21-007-014	1" MP (M) x 20 MM (1-5/16"-12) Type M (M)*	20K/1379
21-007-038	3/4" MP (M) x 20 MM (1-5/16"-12) Type M (M)*	20K/1379
21-007-057	9/16" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379
21-007-063	1" MP (M) x 9/16" MP (M)*	20K/1379
21-007-073	1" MP (M) x 5 MM (9/16"-18) Type M (M)*	20K/1379
21-007-157	9/16" MP (M) x 8 MM (3/4"-16) Type M (M)	20K/1379



* With Gland Nut and Collar

20K Gland Nuts



Part #	Description	PSI/Bar
21-003-001	1/4" MP	20K/1379
21-003-002	3/8" MP	20K/1379
21-003-003	9/16" MP	20K/1379
21-003-004	3/4" MP	20K/1379
21-003-005	1" MP	20K/1379

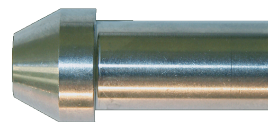
Manufactured by APS specifically for water blasting service, these fittings are made from heavy duty stainless steel because of its reliability and durability.

20K Collars



Part #	Description	PSI/Bar
21-002-001	1/4" MP	20K/1379
21-002-002	3/8" MP	20K/1379
21-002-003	9/16" MP	20K/1379
21-002-004	3/4" MP	20K/1379
21-002-005	1" MP	20K/1379

20K Plugs

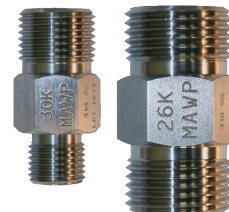


Part #	Description	PSI/Bar
21-004-001	1/4" MP	20K/1379
21-004-002	3/8" MP	20K/1379
21-004-003	9/16" MP	20K/1379
21-004-004	3/4" MP	20K/1379
21-004-005	1" MP	20K/1379

20K Hose Connectors

Type M Male x Type M Male

Part #	Description	PSI/Bar
21-007-015	5MM Type M x 5 MM Type M	40K/2758
21-007-016	8 MM Type M x 8 MM Type M	30K/2068
21-007-017	13 MM Type M x 13 MM Type M	26K/1793
21-007-018	20 MM Type M x 20 MM Type M	26K/1793
21-007-020	5 MM Type M x 8 MM Type M	30K/2068
21-007-021	8 MM Type M x 13 MM Type M	26K/1793
21-007-022	13 MM Type M x 20 MM Type M	20K/1379
21-007-030	5 MM Type M x 13 MM Type M	26K/1793
21-007-043	7/8" Type M x 13 MM Type M	30K/2068



These lance couplers are from heavy duty stainless steel specifically for water blasting service.

20K FITTINGS

20K Tube Adapters

These male by female bushings are used to connect components with female Jetstream lance connections to the industry standard male left-handed medium pressure tubing connections without the use of glands and collars.

Part #	Description	PSI/Bar
21-016-001	TUBE ADAPTER, 1/4" MP LHF X 1/4" MP RH J/S MALE SLIMLINE	20K/1379
21-016-002	TUBE ADAPTER, 3/8" MP LHF X 3/8" MP RH J/S MALE SLIMLINE	20K/1379
21-016-003	TUBE ADAPTER, 9/16" MP LHF X 9/16" MP RH J/S MALE SLIMLINE	20K/1379
21-016-004	TUBE ADAPTER, 3/8" MP RHF X 1/4" MP RH J/S MALE SLIMLINE (.468 O.D.)	20K/1379
21-016-005	TUBE ADAPTER, 9/16" MP LH(F) X 9/16" MP RH(M) SLIMLINE	20K/1379
21-016-006	TUBE ADAPTER, 9/16" MP RH(F) X 9/16" MP LH(M) SLIMLINE	20K/1379
21-016-007	TUBE ADAPTER, 3/8" MP LH(F) X 9/16" MP LH(M) SLIMLINE	20K/1379
21-016-008	TUBE ADAPTER, 1/4" MP RH (F) J/S X 1/4" MP LH (M) SLIMLINE (.375 O.D.)	20K/1379
21-016-010	CLOSE NIPPLE, 9/16"-18 RH J/S MALE X 9/16"-18 RH J/S MALE LANCE SS (J/S TYPE: 53221)	20K/1379
21-016-011	CLOSE NIPPLE, 9/16"-18 RH J/S MALE X 9/16"-18 LH J/S MALE LANCE SS	20K/1379
21-016-012	CLOSE NIPPLE, 3/8"-24 RH J/S MALE X 3/8"-24 RH J/S MALE LANCE SS (J/S TYPE: 52088)	20K/1379
21-016-013	CLOSE NIPPLE, 9/16"-18 RH J/S MALE X 3/8"-24 RH J/S MALE LANCE SS (J/S TYPE: 53149)	20K/1379
21-016-014	CLOSE NIPPLE, 9/16"-18 RH J/S MALE X 1/4"-28 RH J/S MALE LANCE SS (J/S TYPE: 54792)	20K/1379
21-016-015	CLOSE NIPPLE, 3/8"-24 RH J/S MALE X 1/4"-28 RH J/S MALE LANCE SS (J/S TYPE: 52521)	20K/1379
21-016-016	CLOSE NIPPLE, 1/4"-28 RH J/S MALE X 1/4"-28 RH J/S MALE LANCE SS (J/S TYPE: 52437)	20K/1379
21-016-017	TUBE ADAPTER, 1/4" HP LHF X 3/8" MP LH J/S MALE SLIMLINE (.468 DIA.)	20K/1379
21-016-018	TUBE ADAPTER, 3/8" MP RHF X 3/8" MP LH J/S MALE SLIMLINE (.500 DIA.)	20K/1379



20K Slimline Couplings

These small O.D. slimline couplings do not require Gland Nuts or Collars. They are rated for pressures of up to 20,000 PSI. These are ideal for tube blasting applications.



Part #	Description	PSI/Bar
21-013-001	1/4" x 1/4" MP LH (F)	20K/1379
21-013-002	3/8" x 3/8" MP LH (F)	20K/1379
21-013-003	9/16" x 9/16" MP LH (F)	20K/1379
21-013-004	3/4" x 3/4" MP LH (F)	20K/1379
21-013-005	1" x 1" MP LH (F)	20K/1379
21-013-006	3/8" x 1/4" MP LH (F)	20K/1379
21-013-007	9/16" x 1/4" MP LH (F)	20K/1379
21-013-008	9/16" x 3/8" MP LH (F)	20K/1379
21-014-001	1/4" MP LH (F) x 1/4" MP RH (F)	20K/1379
21-014-002	3/8" MP LH (F) x 3/8" MP RH (F)	20K/1379
21-014-003	9/16" MP LH (F) x 9/16" MP RH (F)	20K/1379
21-014-004	3/4" MP LH (F) x 3/4" MP RH (F)	20K/1379
21-014-005	1" MP LH (F) x 1" MP RH (F)	20K/1379
21-014-006	9/16" MP LH (F) x 1/4" MP RH (F)	20K/1379
21-014-007	9/16" MP LH (F) x 3/8" MP RH (F)	20K/1379
21-015-001	1/4" MP RH (F) x 1/4" MP RH (F)	20K/1379
21-015-002	3/8" MP RH (F) x 3/8" MP RH (F)	20K/1379
21-015-003	9/16" MP RH (F) x 9/16" MP RH (F)	20K/1379
21-015-004	3/4" MP RH (F) x 3/4" MP RH (F)	20K/1379
21-015-005	1" MP RH (F) x 1" MP RH (F)	20K/1379
21-015-006	3/8" MP RH (F) x 1/4" MP RH (F)	20K/1379
21-015-007	9/16" MP RH (F) x 1/4" MP RH (F)	20K/1379
21-015-008	9/16" MP RH (F) x 3/8" MP RH (F)	20K/1379

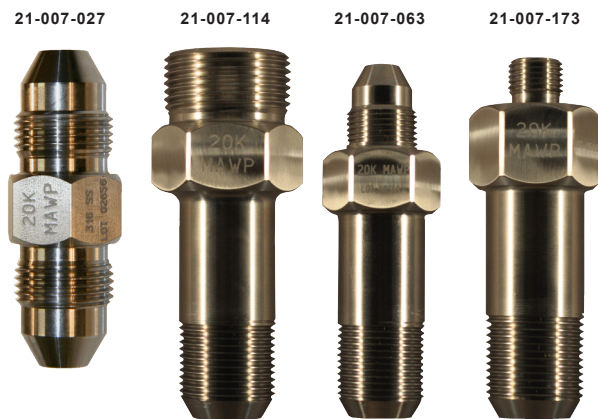
Autoclave Style Tees

Part #	Description	PSI/Bar
21-010-001	1/4" MP	20K/1379
21-010-002	3/8" MP	20K/1379
21-010-003	9/16" MP	20K/1379
21-010-004	3/4" MP	20K/1379
21-010-005	1" MP	20K/1379



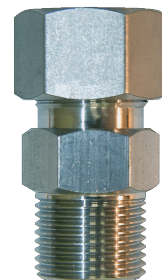
20K Adapters MP Male x MP Male

Part #	Description	PSI/Bar
21-007-023	9/16" MP (M) x 3/4" MP (M)	20K/1379
21-007-024	9/16" MP (M) x 1" MP (M)	20K/1379
21-007-025	3/4" MP (M) x 1" MP (M)	20K/1379
21-007-026	9/16" MP (M) x 9/16" MP (M)	20K/1379
21-007-027	3/4" MP (M) x 3/4" MP (M)	20K/1379
21-007-028	1" MP (M) x 1" MP (M)	20K/1379
21-007-045	3/8" MP (M) x 3/8" MP (M)	20K/1379
21-007-063	1" MP (M) x 9/16" MP (M) W/O Gland Nut & Collar	20K/1379
21-007-114	1" MP (M) x 120MM (1-5/16"-12) Type M Male W/O Gland Nut & Collar	20K/1379
21-007-173	1" MP (M) x 5MM (9/16"-18) Type M Male W/O Gland Nut & Collar	20K/1379



20K Anti-Vibration Gland Assembly

Part #	Description	PSI/Bar
21-005-001	1/4" MP	20K/1379
21-005-002	3/8" MP	20K/1379
21-005-003	9/16" MP	20K/1379
21-005-004	3/4" MP	20K/1379
21-005-005	1" MP	20K/1379



20K Rigid Lances Advanced Pressure Systems proudly offers a growing line of quality rigid lances every pressure and application. These are 304 Stainless Steel. When ordering, please specify left or right hand thread, length and thread size.



Part #	Connection	I.D. & O.D.
51-000-XXX	1/4" MP	.247 OD x .109 ID
51-001-XXX	3/8" MP	.370 OD x .203 ID
51-002-XXX	9/16" MP	.557 OD x .312 ID

20K Carbon Steel Rigid Lances Advanced Pressure Systems now offers quality rigid lances in aircraft quality seamless 4130 steel. When ordering, please specify left or right hand thread, length and thread size.

Part #	Connection	I.D. & O.D.
45-003-XXX	1/4" MP	.247 OD x .109 ID
45-004-XXX	3/8" MP	.370 OD x .203 ID
45-005-XXX	9/16" MP	.557 OD x .312 ID

20K Flex Lance Stingers/Nipples Advanced Pressure Systems offers a growing line of quality flex lance stingers for every pressure and application. Stingers and nipples are offered in 304 stainless steel. Non-standard lengths and right-hand threaded nipples are available upon request. When ordering, please specify length and thread size.

Part #	Thread	Length, In.
21-020-003	1/4" MP	3"
21-020-006	1/4" MP	6"
21-020-008	1/4" MP	8"
21-020-010	1/4" MP	10"
21-020-012	1/4" MP	12"
21-020-024	1/4" MP	24"
21-020-036	1/4" MP	36" (3 Ft.)
21-020-048	1/4" MP	48" (4 Ft.)
21-021-003	3/8" MP	3"
21-021-006	3/8" MP	6"
21-021-008	3/8" MP	8"
21-021-010	3/8" MP	10"
21-021-012	3/8" MP	12"
21-021-024	3/8" MP	24"
21-021-036	3/8" MP	36" (3 Ft.)
21-021-048	3/8" MP	48" (4 Ft.)

Part #	Thread	Length, In.
21-022-003	9/16" MP	3"
21-022-006	9/16" MP	6"
21-022-008	9/16" MP	8"
21-022-010	9/16" MP	10"
21-022-012	9/16" MP	12"
21-022-024	9/16" MP	24"
21-022-036	9/16" MP	36" (3 Ft.)
21-022-048	9/16" MP	48" (4 Ft.)
21-022-060	9/16" MP	60" (5 Ft.)
21-023-006	3/4" MP	6"
21-023-008	3/4" MP	8"
21-023-010	3/4" MP	10"
21-023-012	3/4" MP	12"
21-023-048	3/4" MP	48" (4 Ft.)
21-024-006	1" MP	6"
21-024-008	1" MP	8"
21-024-010	1" MP	10"
21-024-012	1" MP	12"
21-024-024	1" MP	24"
21-024-036	1" MP	36" (3 Ft.)
21-024-048	1" MP	48" (4 Ft.)



**STAINLESS STEEL AND
CARBON STEEL RIGID LANCE,
STINGERS & PIPE NIPPLES**

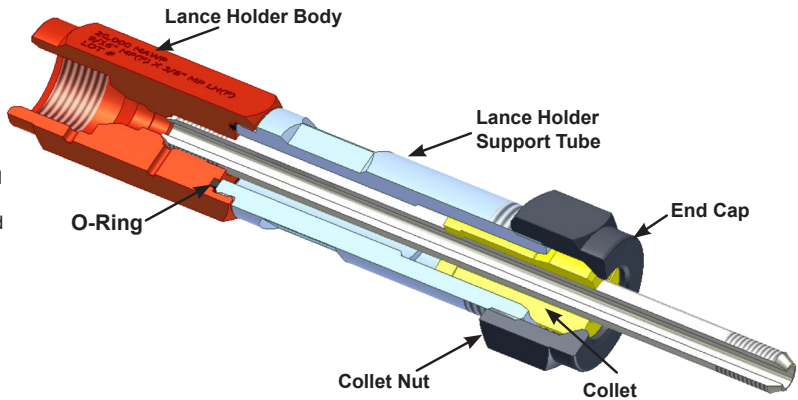
LANCE ACCESSORIES

20K Rigid Lance Holder The threaded end of a rigid lance where it connects directly to a manifold is its weakest point. A break at this threaded connection renders an otherwise good lance unusable.



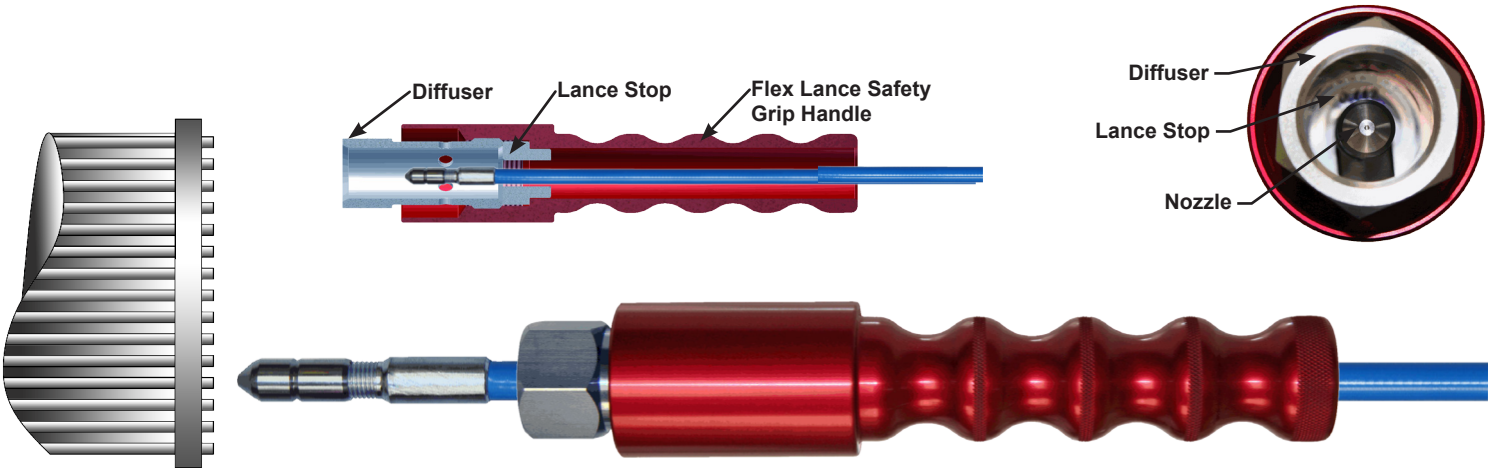
The **Advanced Pressure Systems Rigid Lance Holder** provides full support to the lance at a point well in front of the thread. This Lance Holder is designed to be the best available on the market. It uses a collet and lock nut of the same design as used for a machine shop lathe, which provides a vise like grip on the lance, completely relieving stress on the thread.

Installation or removal of the lance is very easily accomplished: Simply slide the End Cap, Collet and Lance Holder Support Tube onto the lance in that order and then screw the lance into the Lance Holder body. The Lance Holder Tube is then screwed into the Body and then the Collet is secured into the Lance Holder Tube by the End Cap. The lance will then be fully supported.



Part #	20K Lance Holders Description	PSI/Bar
21-030-001	Lance Holder Assy. 9/16" MP (F) x 1/4"-28 RH (F)	20K/1379
21-030-002	Lance Holder Assy. 9/16" MP (F) x 3/8"-24 RH (F)	20K/1379
21-030-003	Lance Holder Assy. 9/16" MP (F) x 9/16"-18 RH (F)	20K/1379
21-030-004	Lance Holder Assy. 9/16" MP (F) x 1/4"-28 LH (F)	20K/1379
21-030-005	Lance Holder Assy. 9/16" MP (F) x 3/8"-24 LH (F)	20K/1379
21-030-006	Lance Holder Assy. 9/16" MP (F) x 9/16"-18 LH (F)	20K/1379

Flex Lance Safety Grip The **FLEX LANCE SAFETY GRIP** is designed to minimize the risk of injury to flex lance operators caused by a live nozzle exiting the tube unexpectedly. The comfortably contoured handle makes it easy to hold the **SAFETY GRIP** against the tube sheet, allowing retraction of an active nozzle into a stainless steel sleeve where the force of the jets is dissipated.



The **FLEX LANCE SAFETY GRIP** is simple to install and is quickly adapted to handle various lance sizes by selecting the appropriately sized **LANCE STOP**.

Part #	Flex Lance Safety Grip
35-009-000	COMPLETE ASSEMBLY: Small Flex Lance Safety Grip*
35-009-001	HANDLE: Small Flex Lance Safety Grip
35-009-007	DIFFUSER: Small Flex Lance Safety Grip

Installation of LANCE STOPS: Simply unscrew the **DIFFUSER** from the **SAFETY GRIP HANDLE**, which will allow the **LANCE STOP** to be removed. Insert the new lance into the back of the **SAFETY GRIP HANDLE**. Select the correct size **LANCE STOP** for the lance to be used and place it onto the lance behind the nozzle end fitting. Insert the nozzle through the **DIFFUSER** and tighten the assembly into the **HANDLE**. (Note: the larger diameter end of the Lance Stop must be next to the end fitting.)



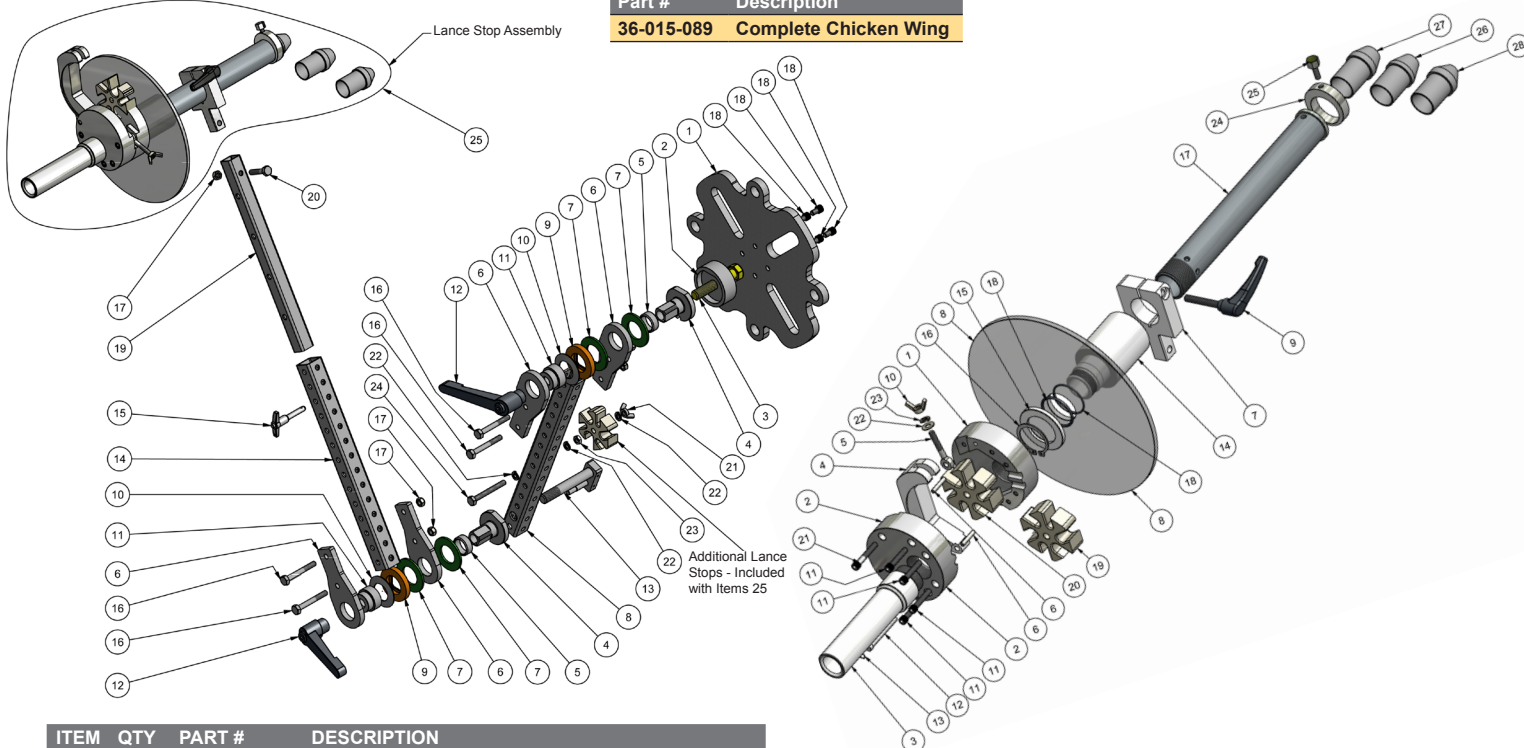
Part #	Lance Stop Description
35-009-002	Stop .323 Flex Lance Safety Guard Lance
35-009-003	Stop .390 Flex Lance Safety Guard Lance
35-009-004	Stop .442 Flex Lance Safety Guard Lance (2005 Lance)
35-009-005	Stop .510 Flex Lance Safety Guard Lance (2006 Lance)
35-009-006	Stop .725 Flex Lance Safety Guard Lance (2108 Lance)
35-009-010	Stop .290 Flex Lance Safety Guard Lance (3/2 & 3004 Lance)
35-009-011	Stop .530 Flex Lance Safety Guard Lance (6005 Lance)
35-009-012	Stop .570 Flex Lance Safety Guard Lance (1/4" NPT & 9/16" Rigid Lance Size)
35-009-013	Stop .470 Flex Lance Safety Guard Lance (4005 Lance)
35-009-014	Stop .870 Flex Lance Safety Guard Lance

Articulated Flex Lance Safety Stop For Tube Sheet Mounting

This takes the Hand Held "Flex Lance Safety Grip" to the next level. This versatile lance stop/anti-withdrawal device attaches easily to the tube sheet for safer pipe cleaning operations. It features ready adaptability to vertical or horizontal applications and its wide range of expansion accommodates any size of tube sheet. Construction is galvanized steel with aluminum handles and includes a **Lexan®** splash guard.

The stops for six sizes of lances are provided by a quick-change insert, which is built into the design. This eliminates the problem of lost lance stops and makes changing to a different lance diameter quick and easy.

Part #	Description
36-015-089	Complete Chicken Wing



ITEM	QTY	PART #	DESCRIPTION
1	1	36-015-026	Chicken Wing Mounting Plate
2	1	36-015-025	Clutch Mounting Plate
3	1	10-121-325	Hex. Head Bolt 5/8"-11 x 3-1/4" long
4	2	36-015-046	Limiter - AWD Modified Torque
5	2	36-015-034	Bearing - Torque Limiter
6	4	36-015-016	Pivot Mounting Plate
7	4	36-015-033	Torque Limiter Fiber Washer
8	1	36-015-018.1	Telespar Arm
9	2	36-015-035	Torque Limiter Spacer (Orange)
10	2	36-015-032	Spring Washer
11	2	36-015-023	Spacer for Torque Limiter
12	2	36-015-028	Handle
13	1	36-015-068	Pivot Pin & Locking Plate Assembly
14	1	36-015-019	Telespar Arm
15	1	36-015-027	Extension Locking Pin
16	4	10-015-250	Hex. Head Bolt 5/16"-18 x 2-1/2" long
17	5	10-100-003	Nylon Lock Nut 5/16"-18 SS
18	4	10-002-050	SHCS 5/16"-18 x 1/2" long SS
19	1	36-015-088	Telespar Extension Arm
20	1	10-015-150	Hex. Head Bolt 5/16"-18 x 3" long
21	1	36-015-076	Wing Nut 5/16"-18 SS
22	3	10-020-002	Lock Washer 5/16" SS
23	1	10-100-006	Jam Hex. Nut 5/16"-18 SS
24	1	10-060-275	Hex. Head Bolt (full thread) 5/16"-18 x 2-3/4" long SS.
25	1	36-015-082-3	Multi Lance Stop Assembly

ITEM	QTY	PART #	DESCRIPTION
1	1	36-015-070	Lance Stop Body - Part 1
2	1	36-015-072	Lance Stop Body - Part 2
3	1	36-015-073	Lance Guide Tube
4	1	36-015-071	Latch - Lance Stop Holder
5	1	36-015-074	Latch Bolt
6	2	36-015-080	Dowel Pin
7	1	36-015-069	Clamp
8	1	36-015-044	Splash Shield (1.5" Size)
9	1	36-015-031	Handle
10	1	36-015-075	Wing Nut
11	4	10-001-125	SHCS 1-1/4" long
12	1	36-015-077	Latch Pivot Pin
13	1	10-022-031	Retaining Clip
14	1	36-015-081	Extension Tube Holder
15	1	36-015-084	Splash Shield Retaining Ring
16	1	10-024-150	Retaining Clip (5100-150) SS
17	1	36-015-087	Extension Tube
18	2	30-002-126	O-Ring Dur. 70
19	1	36-015-007.1	Lance Stop - Parker
20	1	36-015-007.2	Lance Stop - Spir Star
21	1	10-001-150	SHCS 1-1/2" long
22	1	10-010-003	Flat washer
23	1	10-020-001	Lock washer
24	1	36-015-159	Retaining Ring - Guide Bushing
25	1	36-015-160	Hex. Head Thumb Screw
26	1	36-015-161	Flex Lance - Guide Bushing 0.625 I.D.
27	1	36-015-162	Flex Lance - Guide Bushing 0.750 I.D.
28	1	36-015-163	Flex Lance - Guide Bushing 0.437 I.D.

Change of Lance Stop Size:

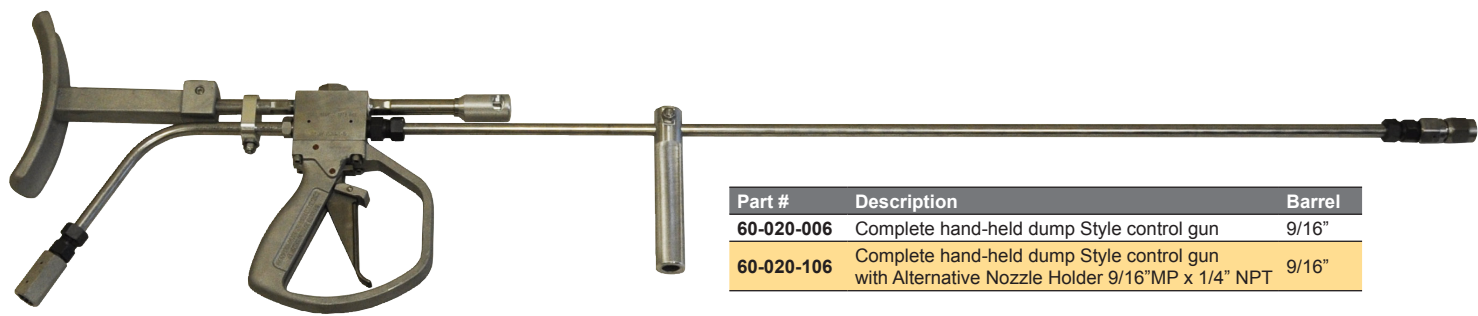
1. Unscrew Cover.
2. Open Lance Stop Retainer Latch.
3. Pull out Lance Stop Insert
4. Feed lance into Support Tube.
5. Select Stop size and install Insert.
6. Close Latch and replace Cover.

Spir-Star
Part # 36-015-007.2



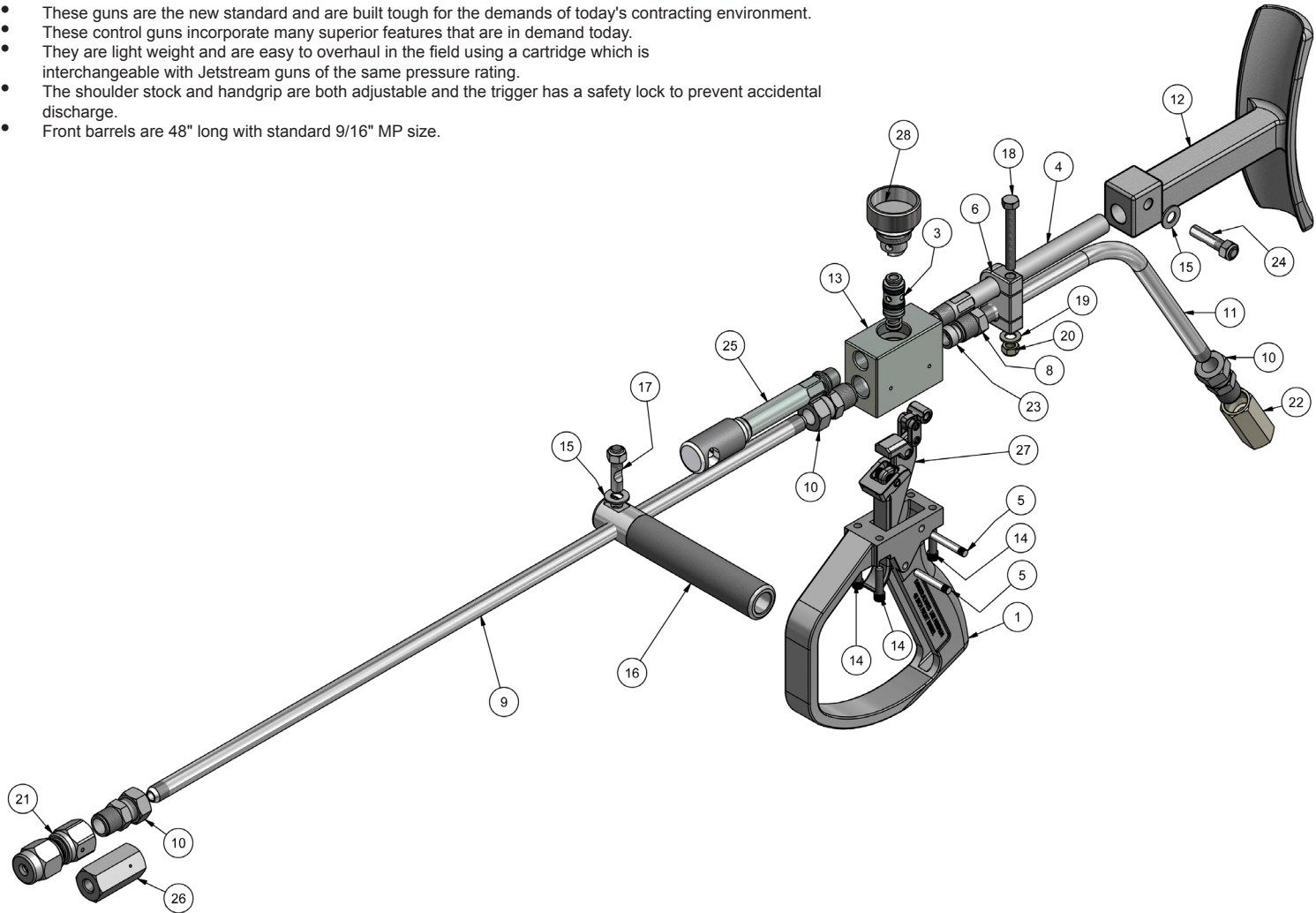
Parker
Part # 36-015-007.1

20K Hand-Held Dump Style Control Guns



Part #	Description	Barrel
60-020-006	Complete hand-held dump Style control gun	9/16"
60-020-106	Complete hand-held dump Style control gun with Alternative Nozzle Holder 9/16"MP x 1/4" NPT	9/16"

- These guns are the new standard and are built tough for the demands of today's contracting environment.
- These control guns incorporate many superior features that are in demand today.
- They are light weight and are easy to overhaul in the field using a cartridge which is interchangeable with Jetstream guns of the same pressure rating.
- The shoulder stock and handgrip are both adjustable and the trigger has a safety lock to prevent accidental discharge.
- Front barrels are 48" long with standard 9/16" MP size.



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	60-010-001	Gun Handle
2	1	60-020-005	Cartridge Nut
3	1	60-020-010	20K Cartridge Assembly
4	1	60-010-009	Shoulder Stock Tube
5	2	60-010-021	Trigger Pivot Pin
6	1	60-020-012	Inlet Tube Clamp
7	2	10-100-002	Nylon Lock Nut
8	1	21-002-003	Gland Nut 5625
9	1	21-022-048	MP Nipple 48" Long
10	3	21-005-003	Anti-Vibe Assy 5625
11	1	60-020-007	Gun Inlet Tube 20K
12	1	60-010-003	Shoulder Stock
13	1	60-020-014	Gun Block 20K
14	4	10-001-100	SHCS 1"

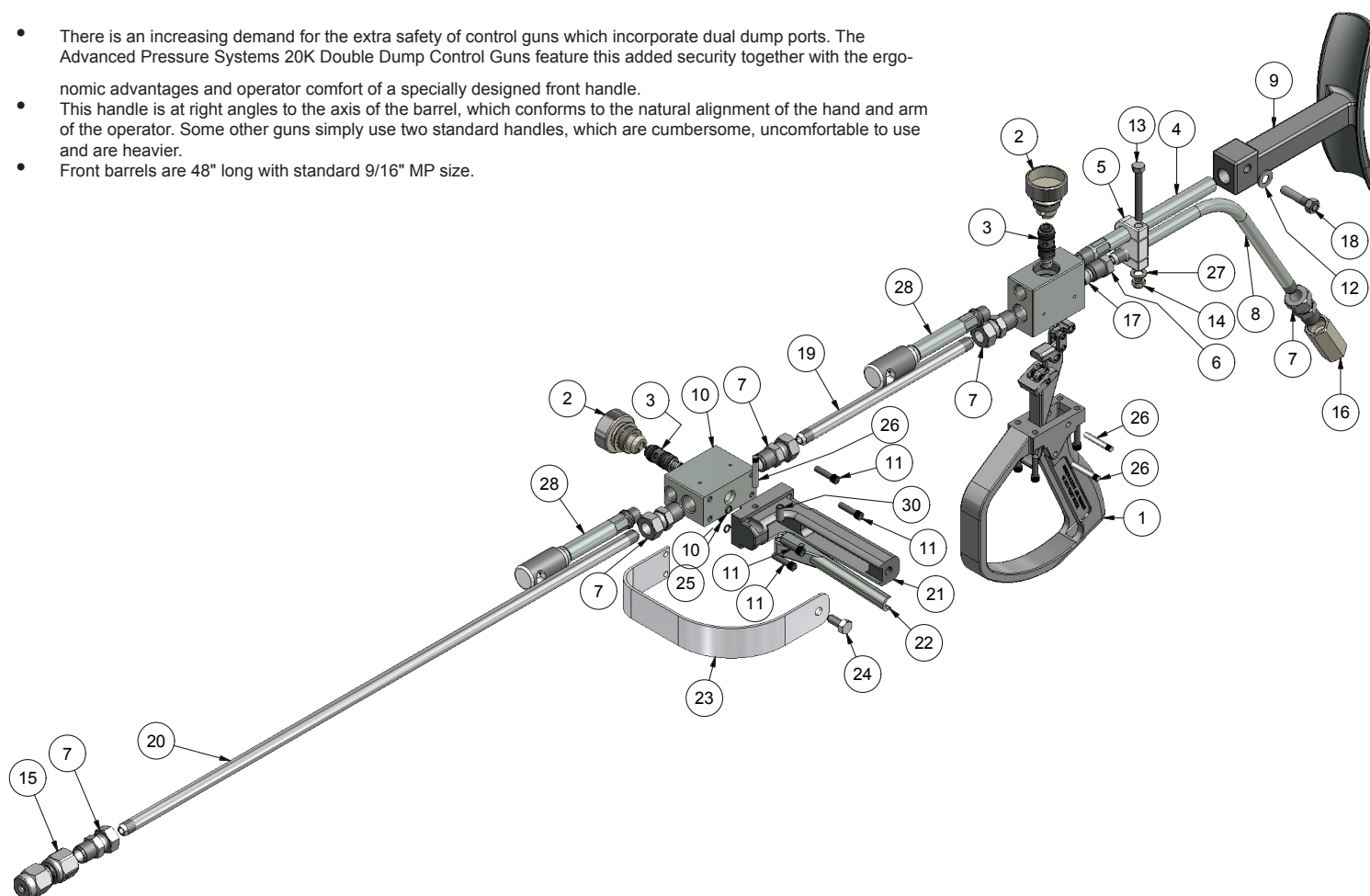
ITEM	QTY	PART NUMBER	DESCRIPTION
15	2	10-010-001	Plain 3/8" SS washer
16	1	60-020-008	Front Handle 9/16" Barrel
17	1	60-020-009	Cam Stud - Front Handle 20K Gun
18	1	10-017-250	Clamp Bolt SS 5/16"-18, x 2-1/2" long
19	1	10-010-002	5/16" Flat Washer
20	1	10-100-003	Nylon Lock Nut 5/16"-18
21	1	17-025-000	Nozzle Holder Assembly
22	1	21-012-103	Coupling 9/16"MP (without Gland Nut & Collar)
23	1	21-003-003	Collar
24	1	60-010-017	Shoulder Stock Cam Stud
25	1	60-010-057	Dump Tube Assembly
26	1	20-028-101	9/16"MP x 1/4" NPT (Alternative Nozzle Holder)
27	1	60-010-061	Trigger & Cam Assy. w/Safety Latch
28	1	60-010-005	"Handi Change" Cartridge Nut 20K

20K Hand-Held Double-Dump Control Guns



Part #	Description	Barrel
60-055-001	Complete hand-held double dump Style control gun	9/16"

- There is an increasing demand for the extra safety of control guns which incorporate dual dump ports. The Advanced Pressure Systems 20K Double Dump Control Guns feature this added security together with the ergonomic advantages and operator comfort of a specially designed front handle.
- This handle is at right angles to the axis of the barrel, which conforms to the natural alignment of the hand and arm of the operator. Some other guns simply use two standard handles, which are cumbersome, uncomfortable to use and are heavier.
- Front barrels are 48" long with standard 9/16" MP size.



ITEM	QTY	PART #	DESCRIPTION
1	1	60-010-001	Gun Handle
2	2	60-020-005	"Handi Change" Cartridge Nut 20K
3	2	60-020-010	Cartridge Assembly 20K
4	1	60-010-009	Shoulder Stock Tube
5	1	60-020-012	Inlet Tube Clamp
6	1	21-002-003	Collar 9/16" MP
7	5	21-005-003	MP Anti-Vibe Assy.
8	1	60-020-007	Gun Inlet Tube 20K
9	1	60-010-003	Shoulder Stock
10	2	60-020-014	BLOCK, 20K CONTROL GUN (NEW)
11	8	10-001-100	SHCS 1/4"-20 1" Long
12	1	10-010-001	3/8" Plain Washer
13	1	10-017-250	Hex Head 5/16"-18 x 2-1/2" long
14	1	10-100-003	Nylon Locknut 5/16"-18 SS
15	1	17-025-000	Nozzle Holder Assy.20K 9/16" MP (Drop In)

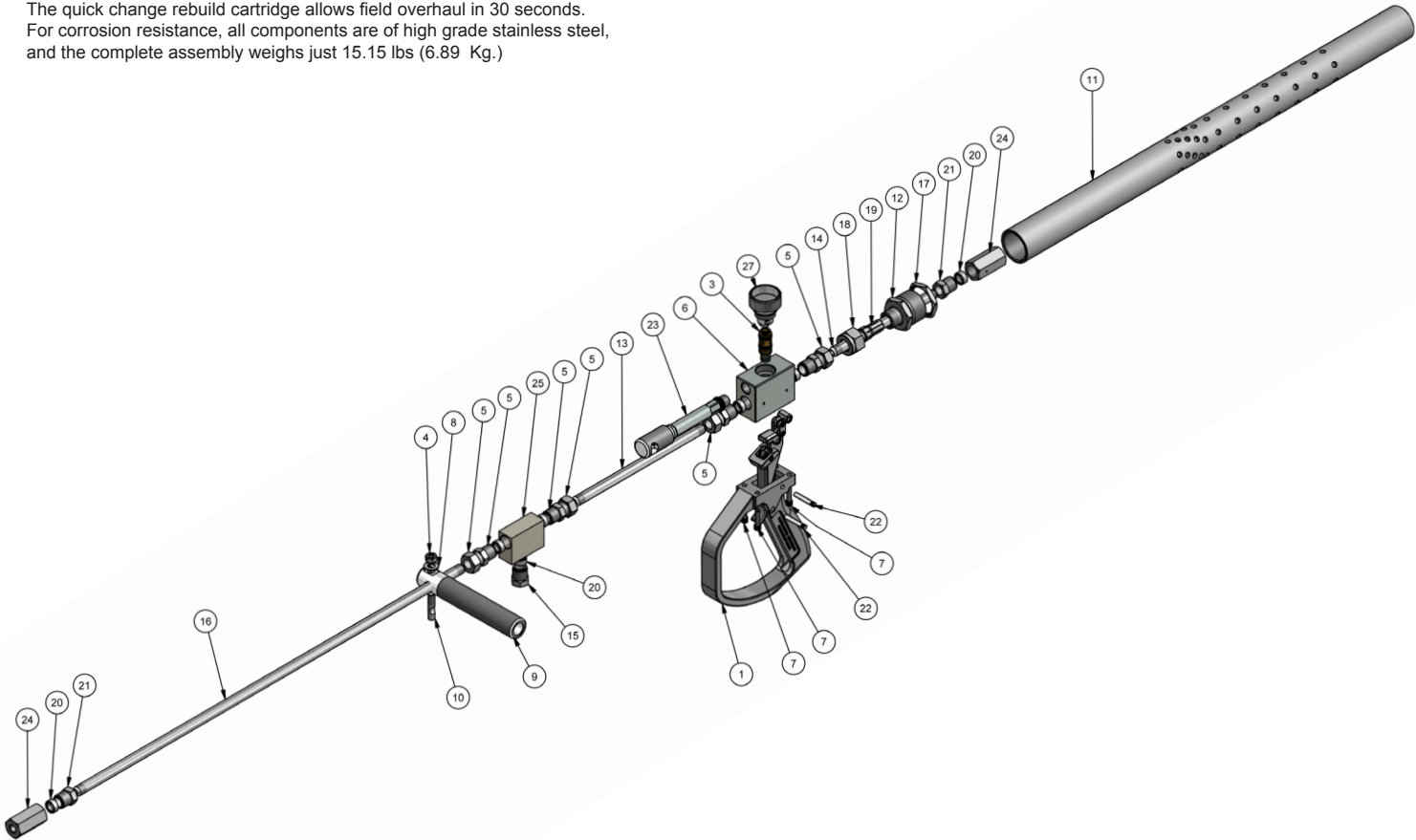
ITEM	QTY	PART #	DESCRIPTION
16	1	21-012-103	Coupler 9/16"MP 20K without Gland Nut & Collar
17	1	21-003-003	9/16" Gland Nut MP
18	1	60-010-017	Cam Stud for Shouldder Stock
19	1	21-022-010	NIPPLE, 9/16" MP/LH X 10" SS (20K MAWP)
20	1	21-022-036	NIPPLE, 9/16" MP/LH X 36" SS (20K MAWP)
21	1	60-050-002	Double Dump Handle
22	1	60-050-003	Double Dump Trigger
23	1	60-050-005	Double Dump Trigger Guard
24	1	10-016-075	3/8"-16 Bolt, 3/4" long
25	2	30-001-010	O-Ring 2-010
26	3	60-010-021	Trigger Pivot Pin
27	1	10-010-002	Washer. Flat 5/16"
28	2	60-010-057	Dump Tube Assembly
29	1	60-010-061	Trigger & Cam Assy. w/Safety Latch

20K Hand-Held Zero-Thrust Control Guns



Part #	Description	Barrel
60-020-013	Complete zero thrust Style control gun	9/16"

- These guns are designed primarily for underwater use, where the self cancelling forwards and backward thrusts allow the user to carry out blasting operations without being propelled away from the intended work area.
- They also have application on dry land where a balanced tool is needed, such as in a suspended gondola on the side of a building.
- The quick change rebuild cartridge allows field overhaul in 30 seconds.
- For corrosion resistance, all components are of high grade stainless steel, and the complete assembly weighs just 15.15 lbs (6.89 Kg.)



ITEM	QTY	PART #	DESCRIPTION
1	1	60-010-001	Gun Handle
3	1	60-020-010	Cartridge Assembly
4	1	10-100-002	3/8"-16 Nylon Lock Nut
5	4	21-005-003	Anti-vibration Collet Assy. (includes collar)
6	1	60-020-001	Gun Block
7	4	10-001-100	SHCS 1/4"-20 SS
8	1	10-010-001	Washer 3/8" Plain
9	1	60-020-008	Front Handle 9/16" Barrel
10	1	60-020-009	Cam Stud - Front Handle 20K Gun
11	1	60-010-032	Diffuser for Zero Thrust Gun
12	1	60-020-015	Diffuser Adapter for 20K Zero Thrust Gun
13	1	21-022-010	Nipple - 9/16" MP 10" long
14	1	21-022-008	Nipple - 9/16" MP 8" long

ITEM	QTY	PART #	DESCRIPTION
15	1	21-002-003	Gland Nut - 9/16" MP
16	1	21-022-036	Nipple - 9/16" MP 36" long
17	1	60-010-033	Jam Nut for Thrust Diffuser
18	1	20-002-004	Collet Nut
19	1	20-022-010	Collet - 9/16"
20	3	21-002-003	Collar, 9/16" MP 20K SS
21	3	21-003-003	Gland Nut, 9/16" MP 20K SS
22	2	60-010-021	Trigger Pivot Pin
23	1	60-010-057	Dump Tube Assembly
24	2	20-028-101	Nozzle Holder - 9/16" x 1/4" NPT Nozzle Holder
25	1	21-010-103	Tee 9/16" MP w/o Gland Nut and collar
26	1	60-010-061	Trigger Assembly
27	1	60-010-005	"Handi Change" Cartridge Nut 20K

20K Foot Operated Dump Style Control Guns

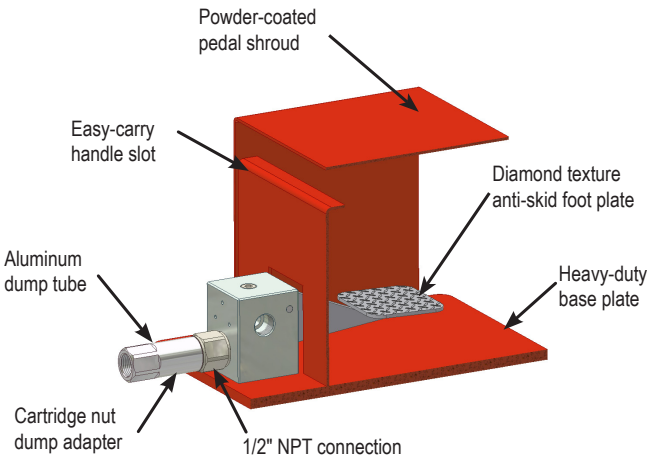
Typical Foot Gun Hookup These foot operated control valves (foot guns) are designed for smooth reliable operation. They are easily rebuilt in the field in 30 seconds by unscrewing the dump tube, which removes the used valve assembly. The operator then snaps a new cartridge style valve into the dump tube adapter and returns the whole assembly to the gun.

To prevent low pressure water from the flex lance nozzle spraying back towards the operator, when the foot gun is in dump mode, it is recommended that a Nozzle Shut-off Valve (**Part # 60-020-0??**) is used between the foot gun and the flex lance. This will help to minimize cleanup at the end of the job and greatly assist the operator when inserting the lance into the next tube. (see diagram above)

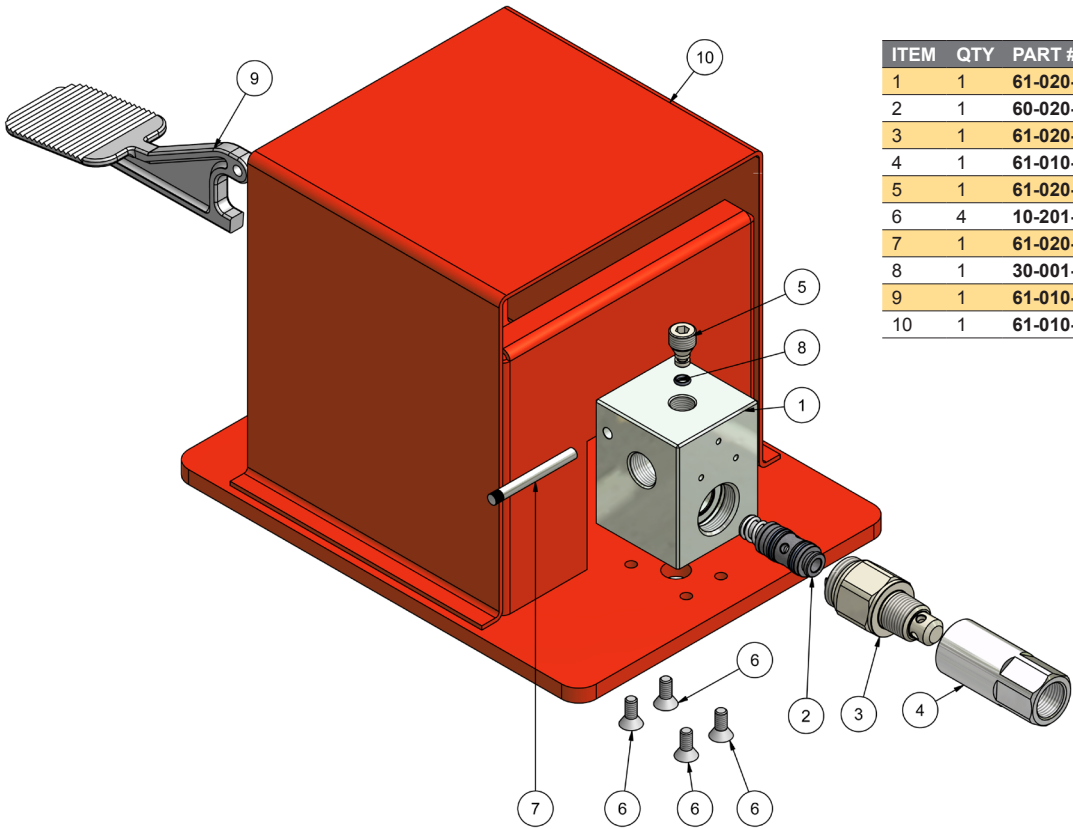
Strain Relief Whip Hoses (**Part # 43-004-003**) are designed to relieve the forces on the flex lance end fitting, which extends the life of the lance, and reduces the risk to the operator associated with the end fitting failing prematurely.



Part #	Description
61-020-003	Complete foot Style control gun



- Features:**
- Fully enclosed safety shrouds.
 - Easy-carry handles.
 - Quick-change cartridge overhaul.
 - Non-slip diamond texture foot pedals.
 - Powder-coated pedal shroud
 - Cartridge nut / dump adapter
 - 9/16" MP connection
 - Aluminum dump tube
 - Heavy-duty base plate



ITEM	QTY	PART #	DESCRIPTION
1	1	61-020-001	20K Foot Gun Block
2	1	60-020-010	20K Cartridge assembly
3	1	61-020-004	Dump Adapter - 20K Foot Gun
4	1	61-010-002	Dump Tube
5	1	61-020-002	Plug for 20K Foot Gun Block
6	4	10-201-063	1/4"-20 c'sink socket Head screws 5/8" long
7	1	61-020-005	Pivot Pin
8	1	30-001-009	O-Ring
9	1	61-010-007	Foot Pedal
10	1	61-010-004	Foot Gun Base Assembly

Easy-Change Cartridge Assembly The cartridge assembly enables rebuilding of the gun in the field in 30 seconds or less with common tools.

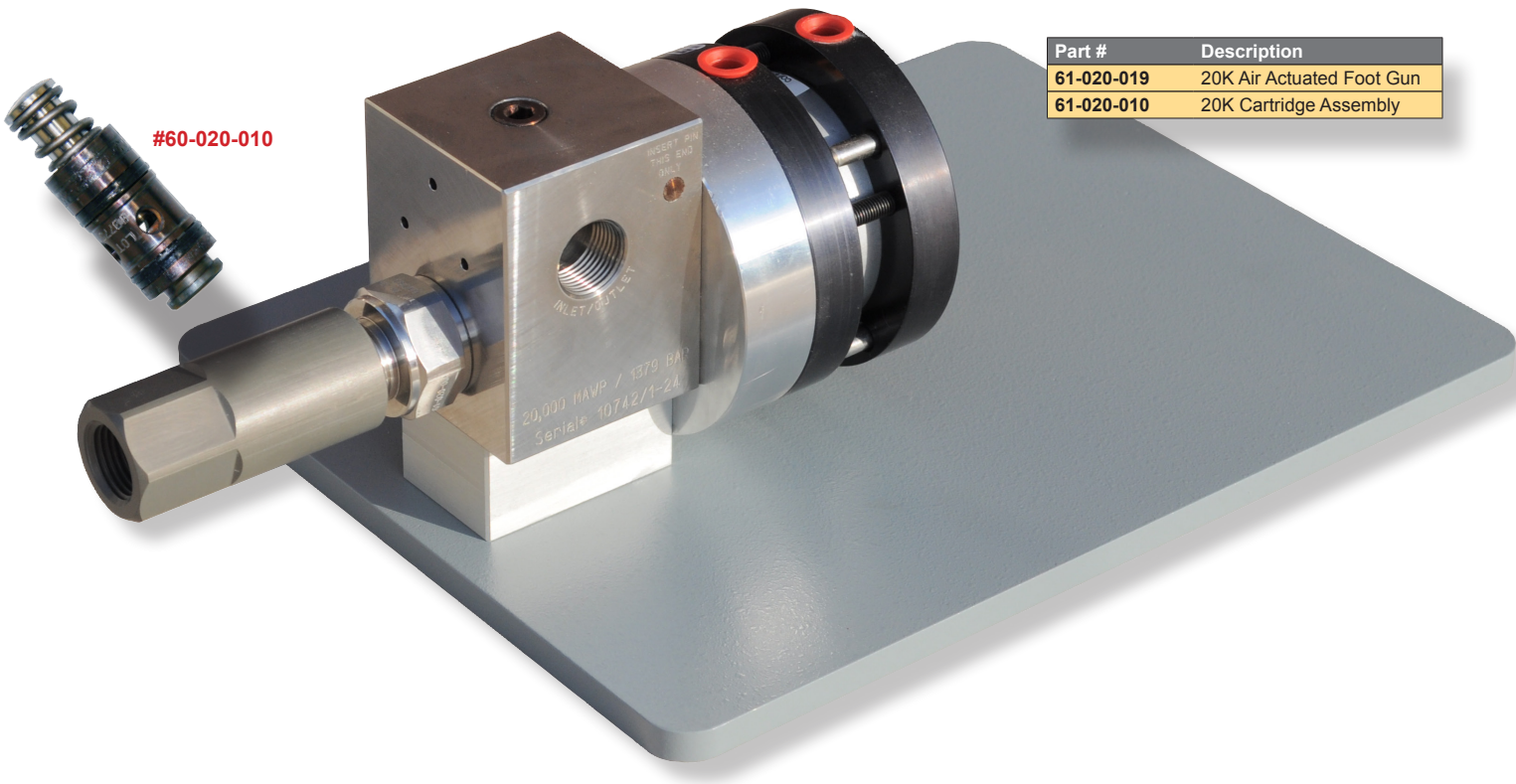


20K AIR-OPERATED DUMP VALVE

20K Air-Operated Dump Valves

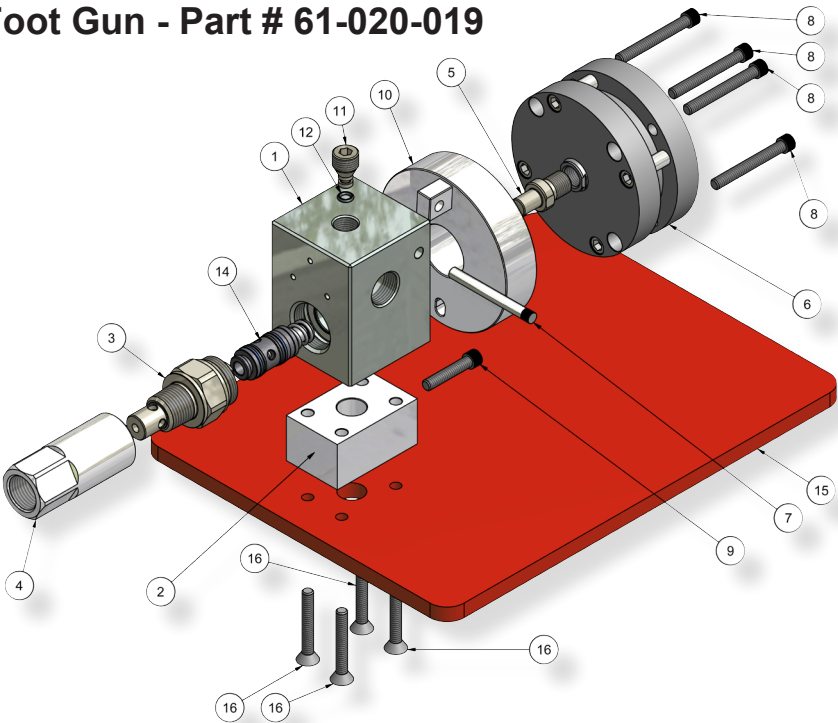
The Air-Operated Dump Valve allows an operator to remotely control pressure in cleaning applications for 20,000 psi. When air is sent to the cylinder, the valve closes and allows the system to build pressure. The valve opens when the air is exhausted, reducing system pressure to near atmospheric.

- 30-second field replaceable cartridge design for minimal downtime
- Remote pneumatic operation for reduced operator fatigue and added convenience and safety
- Inlet and outlet connections threaded 9/16 MP
- Heavy-duty air cylinder
- All components precision machined from stainless steel

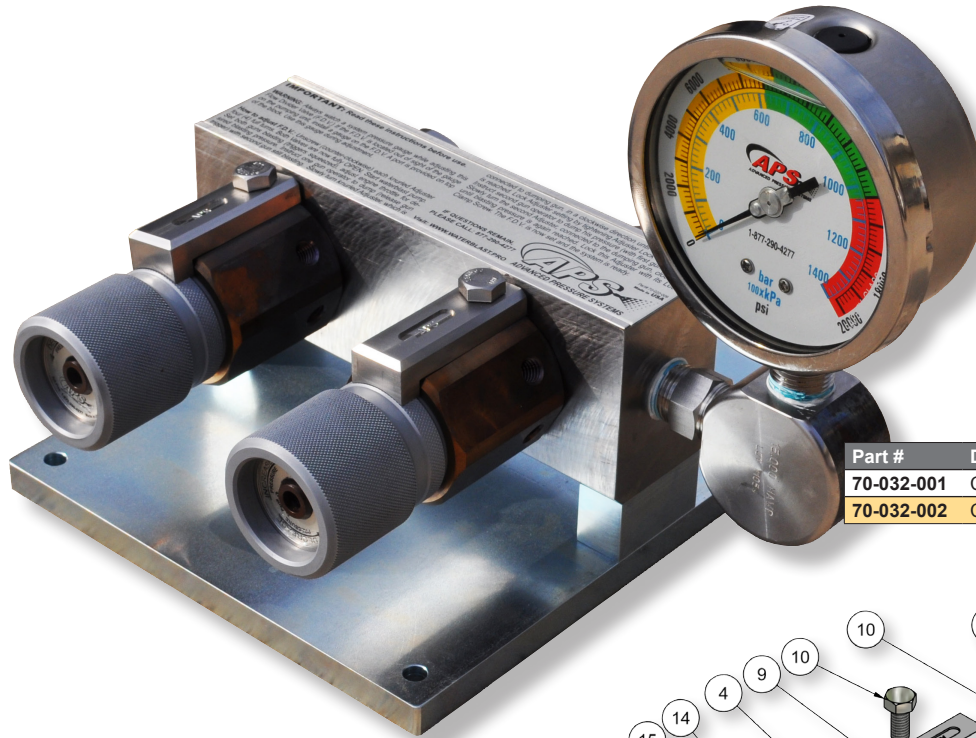


20K Air Actuated Foot Gun - Part # 61-020-019

ITEM	QTY	PART #	DESCRIPTION
1	1	61-020-001	20K Foot Gun Block
2	1	61-001-002	Spacer Block
3	1	61-020-004	Dump Adapter 20K Foot Gun
4	1	61-010-002	Dump Tube
5	1	61-001-003	Plunger for Air Actuator
6	1	61-001-004	Air Actuator
7	1	61-020-005	20K Foot Gun Pivot Pin
8	4	10-001-200	1/4"-20 SHCS 2" long
9	1	10-001-125	1/4"-20 SHCS 1-1/4" long
11	1	61-002-001	Plate - 20K Air Actuated Foot Gun
10	1	61-020-002	Plug for 20K Foot Gun Block
12	1	30-001-009	O-Ring
13	4	10-001-112	1/4"-20 SHCS 1-1/8" long
14	1	60-020-010	20K Cartridge Assembly
15	1	61-010-006	Foot Gun Base Plate
16	4	10-201-175	C'sink 1/4"-20 Flat Head SHCS, 1-3/4" long SS



FDV-20K Flow Divider Valve The new Advanced Pressure Systems **Flow Divider Valve (FDV)** is for applications where two dump style guns are to be operated from one pump. The FDV will maintain full pressure to either gun when the other gun is dumping. When both guns are operating, the flow and pressure will be unaffected. These valves are very easy to set up. They are of very rugged construction, and the only wear part is a cartridge which can be quickly changed in the field.

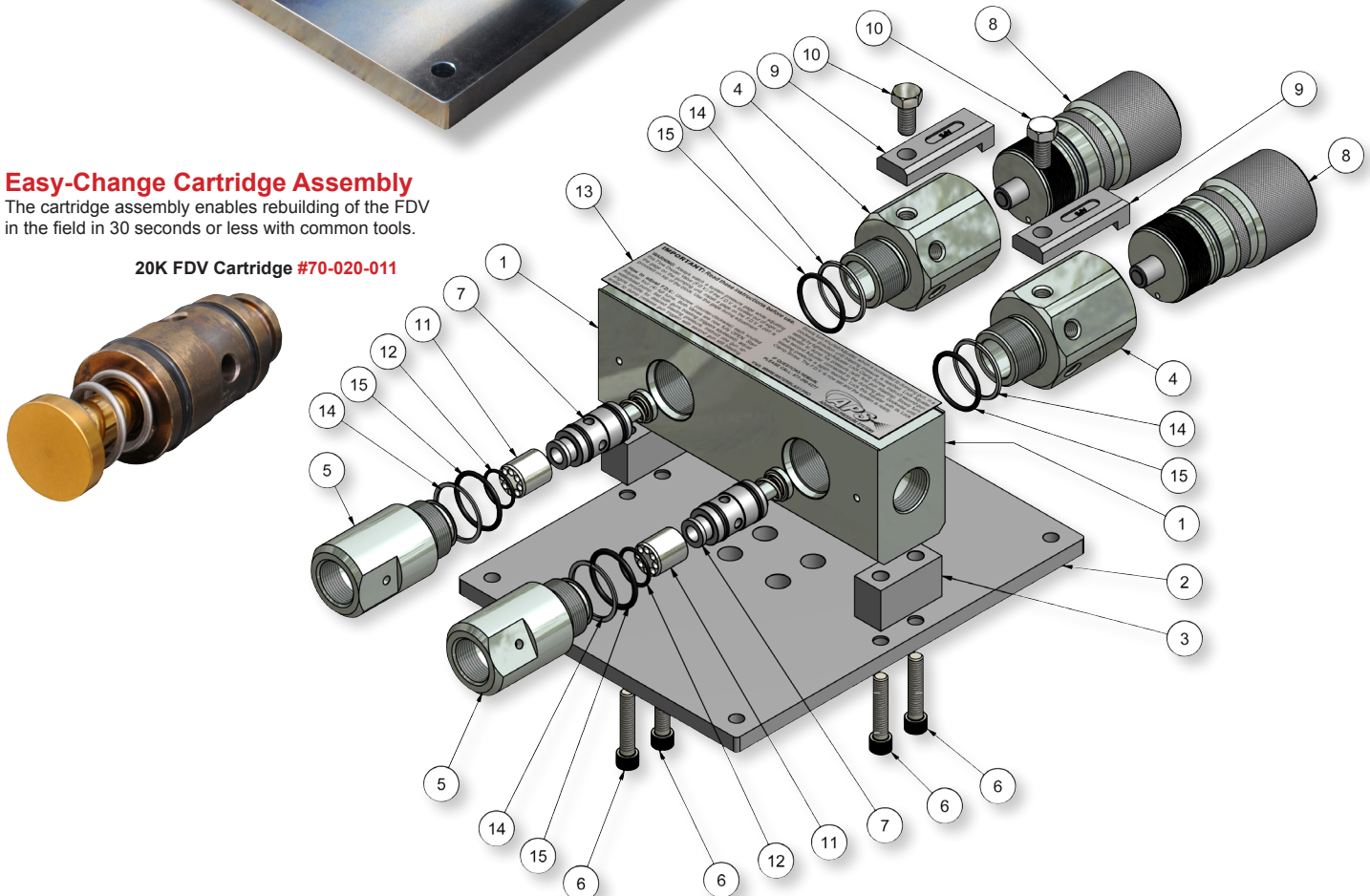


Part #	Description
70-032-001	Complete 20K flow divider valve
70-032-002	Complete 20K flow divider valve (with Gauge)

Easy-Change Cartridge Assembly

The cartridge assembly enables rebuilding of the FDV in the field in 30 seconds or less with common tools.

20K FDV Cartridge #70-020-011



20K FLOW DIVIDER VALVE (FDV)

ITEM	QTY	PART #	DESCRIPTION
1	1	70-032-003	20K FDV Manifold
2	1	70-022-014	15/20K FDV Base Plate
3	2	70-022-013	15/20K FDV Base Plate Support Block
4	2	70-032-017	20K FDV Adjuster Adapter
5	2	70-032-016	20K FDV Discharge Adapter
6	4	10-002-150	SHCS 5/16"-18 x 1-1/2" long SS
7	2	70-020-011	20K FDV Cartridge Assembly
8	2	70-022-004	15/20K FDV Adjuster Handle Assembly

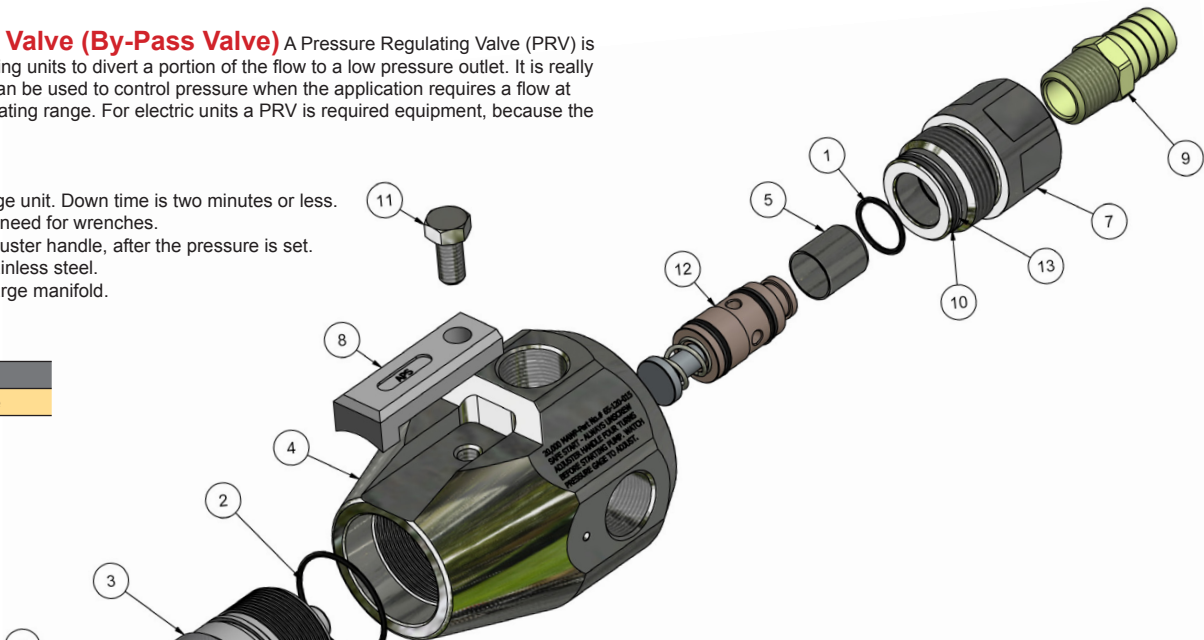
ITEM	QTY	PART #	DESCRIPTION
9	2	70-110-008	15/20K FDV Adjuster Locking Clamp
10	2	10-016-075	Bolt, Hex. Head 3/8"-16 x 3/4" long SS
11	2	70-010-013	15/20K FDV Diffuser
12	2	30-001-018	O-Ring 2-018
13	1	70-022-009	15/20K FDV Instruction Nameplate
14	4	70-032-018	20K FDV Back-up Ring (split)
15	4	30-001-122	O-Ring 2-122

20K Pressure Regulating Valve (By-Pass Valve) A Pressure Regulating Valve (PRV) is used on both diesel and electric pumping units to divert a portion of the flow to a low pressure outlet. It is really a hand adjusted needle valve, and it can be used to control pressure when the application requires a flow at the low end of the pumping unit's operating range. For electric units a PRV is required equipment, because the speed of the drive is not adjustable.

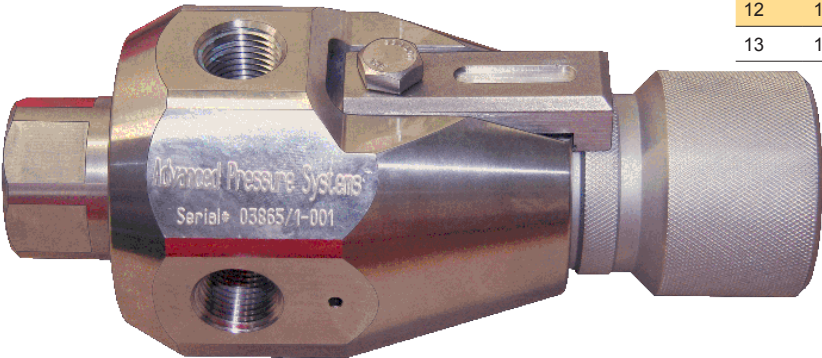
The design provides:

- Simple field rebuild using a cartridge unit. Down time is two minutes or less.
- Easy hand adjustment without the need for wrenches.
- This includes the locking of the adjuster handle, after the pressure is set.
- All components machined from stainless steel.
- Direct mounting to fluid end discharge manifold.

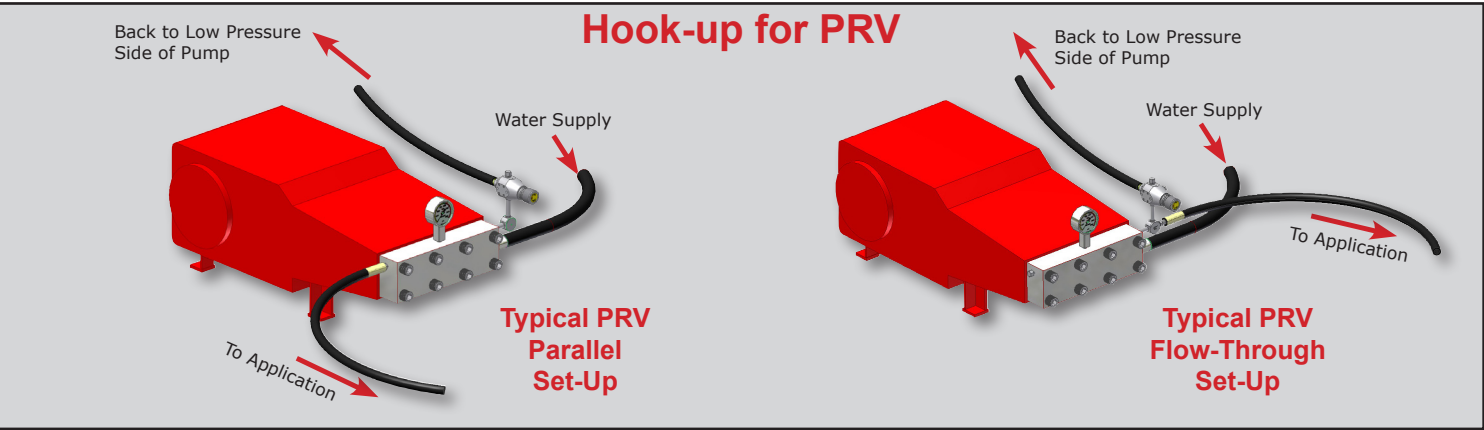
Part #	Description
65-020-005	Gauge Board Complete



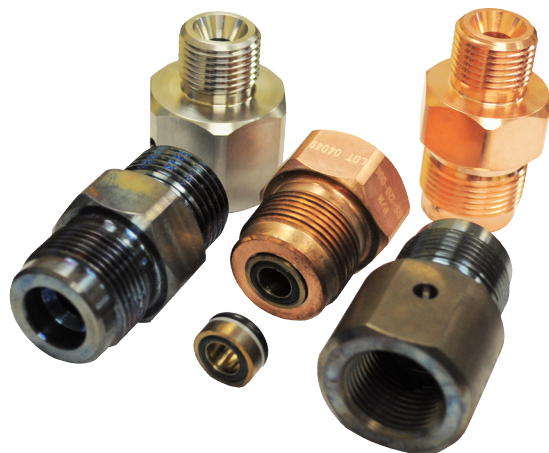
ITEM	QTY	Part #	Part Description
1	1	30-001-018	O-Ring, 2-018 Buna-N 90 Dur.
2	1	30-001-029	O-Ring, 2-029 Buna-N 90 Dur.
3	1	65-110-003	Adjuster Handle, 15K/20K PRV
4	1	65-120-003	PRV Body, 20K Pressure Regulating Valve (PRV)
5	1	70-010-013	Diffuser, 15K/20K
6	1	70-010-019	Decal, PRV/FDV Adjuster Handle
7	1	70-120-015	Discharge Adapter, 1/2" NPT (F)
8	1	70-110-008	Adjuster Handle Clamp
9	1	70-110-009	Brass Hose Barb Fitting, 1/2" NPTM X 3/4" Hose
10	1	30-001-121	O-Ring, 2-121 Buna-N 90 Dur.
11	1	10-016-075	Bolt, Hex Head 3/8"-16 X 3/4" long SS
12	1	70-020-011	20K FDV/PRV Cartridge Assembly
13	1	30-003-121	Parbak backup ring



Part #	Description
65-120-015	Complete pressure regulating valve



20K J/S Type Port Fittings



Part #	Description
65-120-003	BODY, J/S TYPE 20K PRESSURE REGULATING VALVE (PRV)
65-120-004	BUSHING, J/S TYPE 1"-16 RHM X 9/16" MP (F) W/O SEAL ASSY.
65-120-005	ADAPTER, 1"-16 RHM X 9/16" MP (F) W/ SEAL ASSY. (J/S TYPE 52044)
65-120-006	PLUG, J/S TYPE 1"-16 RHM W/O SEAL ASSY.
65-120-007	PLUG, J/S TYPE 1"-16 RHM W/ SEAL ASSY. (J/S TYPE 52076)
65-120-008	HOUSING, J/S TYPE HP SS SEAL
65-120-009	SPACER, .563 O.D. X .438 I.D. ANTI-EXTRUSION
65-120-011	SEAL ASSY., 20K FACE (J/S TYPE 52040)
65-120-015	ASSY., 20K J/S TYPE PRESSURE REGULATING VALVE (PRV) (J/S TYPE: 54592)
65-120-016	ADAPTER, J/S TYPE 1"-16 RHM X 5MM (9/16"-18) TYPE M W/O SEAL ASSY. 20K
65-120-017	ADAPTER, J/S TYPE 1"-16 RHM X 8MM (3/4"-16) TYPE M W/O SEAL ASSY. 20K
65-120-018	ADAPTER, J/S TYPE 1"-16 RHM X 13MM (1"-12) TYPE M W/O SEAL ASSY. 20K
65-120-019	ADAPTER, J/S TYPE 1"-16 RHM X 1-5/16" TYPE M W/O SEAL ASSY.
65-120-020	ADAPTER, J/S TYPE 1"-16 RHM X 9/16" TYPE M W/ SEAL ASSY.(J/S TYPE 54739)
65-120-021	ADAPTER, J/S TYPE 1"-16 RHM X 3/4" TYPE M W/ SEAL ASSY. (J/S TYPE 54741)
65-120-022	ADAPTER, J/S TYPE 1"-16 RHM X 1" TYPE M W/ SEAL ASSY. (J/S TYPE 53284)
65-120-023	ADAPTER, J/S TYPE 1"-16 RHM X 1-5/16" TYPE M W/ SEAL ASSY. (J/S TYPE 54749)
65-120-024	ADAPTER, J/S TYPE 1"-16 RHF X 8MM (3/4"-16) TYPE M 20K
65-120-025	ADAPTER, J/S TYPE 1"-16 RHM X 1"-16 RHF X 2.5" LONG W/O SEAL ASSY.
65-120-026	ADAPTER, J/S TYPE 1"-16 RHM X 1/2" NPT(M) W/O SEAL ASSY. 15K MAWP
65-120-027	ADAPTER, J/S TYPE 1"-16 RHM X 1/2" NPT(M) W/ SEAL ASSY. 15K MAWP
65-120-028	ADAPTER, J/S TYPE 1"-16 RHM (PORT) X M24 X 1.5 (M) W/ SEAL ASSY. (1379 MAX. BAR)
65-120-029	ADAPTER, J/S TYPE 1"-16 RHM (PORT) X M24 X 1.5 (M) W/O SEAL ASSY. (1379 MAX. BAR)
65-120-030	TOOL, 65-120-011 SEAL ASSEMBLY (NOT FOR SALE)
65-120-031	ADAPTER, 1"-16 RHM (PORT) X 3/4" MP (F) W/SEAL ASSY. 20K MAWP (J/S TYPE: 54737)
65-120-031	1 ADAPTER, J/S TYPE 1"-16 RHM (PORT) X 3/4" MP (F) W/O SEAL ASSY. 20K
65-120-035	ADAPTER, J/S TYPE 1"-16 RHM X 1"-16 RHF X 2.5" LONG W/ SEAL ASSY.

Relief Valve 20,000 psi. (Field Adjustable)
1/4" HPF Bottom inlet conn X 1/4" NPT outlet.



#35-013-009

TOOLS

APS offers a complete line of coning and threading tool kits for manually coning and threading 1/4" O.D. to 9/16" O.D. tubing.

There are three different tool kit versions, "High" pressure, and the "Complete Kit" that contains both the Medium and the High Pressure tools. All items are conveniently packaged in a sturdy hand carry tool case with removable top tray. The unique coning and threading tool designs allows for interchangeability between components, eliminating multiple tool inventories.

Coning and Threading Tool Kit



SAFETY ACCESSORIES

Whip Hose With Safety Shrouds Safe operation of hand held control guns requires the use of a Safety Shroud to guard the operator from failure of the hose fitting at the point where it is connected to the gun. Both of these shrouds have a nitrile outer cover, which resists oil, water and many solvents, and an inner layer of braided stainless steel Safety Shrouds are essential equipment, and should be used in conjunction with a whip hose, which allows for connection to different high pressure sources, without the need to make frequent connections to the gun.

NEVER USE A CONTROL GUN WITHOUT A SAFETY SHROUD.

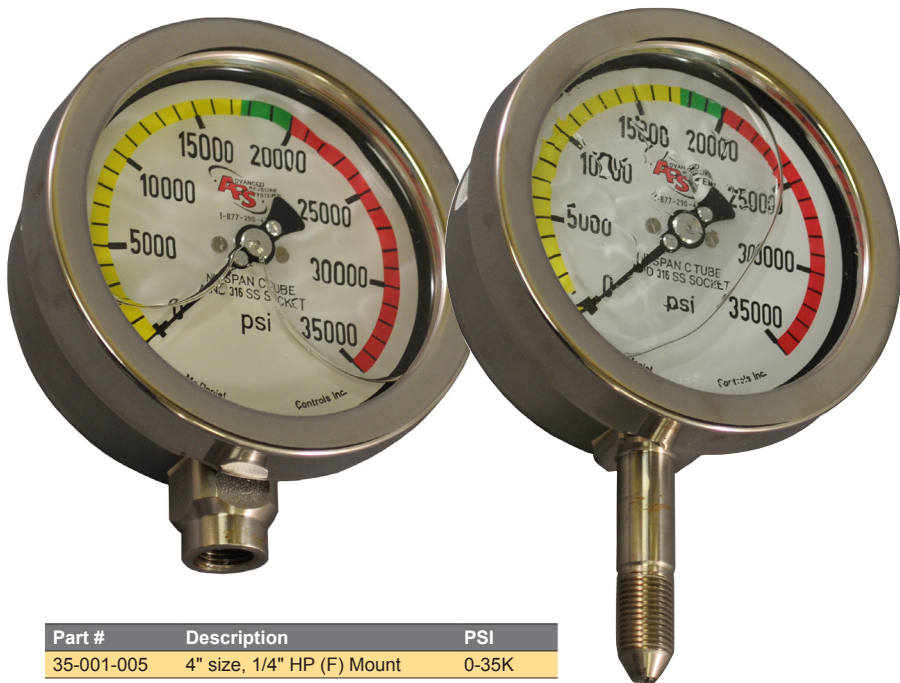


The European Type Shroud, which will fit virtually any gun, and is held in place by an adjustable strap. It is light in weight, and with universal application it is a popular alternative to the Standard Screw Type Shroud.

The Screw Type Shroud is held in place by a Shroud Adapter. This style is customized to fit specific guns and is very reliable and durable.

Part #	Whip Hose Shroud Assemblies
44-021-050	15-40K European Style Safety Shroud Assy. 3 Ft. Whip Hose
44-021-055	15-40K European Style Safety Shroud Assy. 6 Ft. Whip Hose
44-021-054	15-40K European Style Safety Shroud Assy. 10 Ft. Whip Hose
44-021-001	20K Screw Type Safety Shroud with 6 Ft. Whip Hose (4113ST x 13 mm Type M x 9/16" HP LH SS Tube Nipple)
44-021-002	20K Screw Type Safety Shroud with 6 Ft. Whip Hose (4008ST x 8 mm SS Type M B/E)
44-021-003	20K Screw Type Safety Shroud with 6 Ft. Whip Hose (4008ST x 8 mm SS Type M x 9/16" MP LH SS Tube Nipple)
44-021-004	20K Screw Type Safety Shroud with 6 Ft. Whip Hose (4008ST x 9/16" MP LH SS Tube Nipple B/E)
44-021-009	20K Screw Type Safety Shroud with 10 Ft. Whip Hose (4008ST x 8 mm SS Type M x 9/16" MP LH SS Tube Nipple)

20K Waterblast Pressure Gauges APS offers a complete range of Pressure Gauges designed specifically for water blasting applications. Features include stainless steel construction, glycerine filled, clear laminated safety glass, precision movement, easy-to-read color-coded gauge faces.



Part #	Description	PSI
35-001-005	4" size, 1/4" HP (F) Mount	0-35K
35-001-006	4" size, 9/16" HP (M) Mount	0-35K

Hose Whip Checks APS strongly recommends the use of "whip check" hose restrainers in any water jetting operation. These are perhaps the simplest and least expensive safety measure to implement. A "whip check" can be attached at any point where two hoses are joined, or to a pump's fluid end at the discharge side, or where a hose attaches to any piece of water blasting equipment such as a water blast lancing or cutting system.

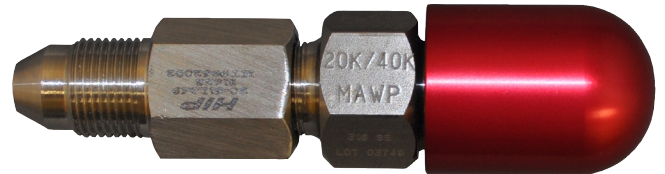
When a high pressure hose is joined to a piece of equipment, the whip check should be used to restrain the movement of the pressurized hose should it become uncoupled, thereby allowing operators to get away and perform a safe, orderly system shut-down.



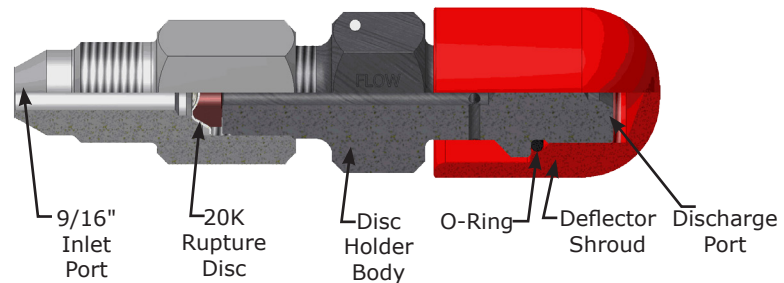
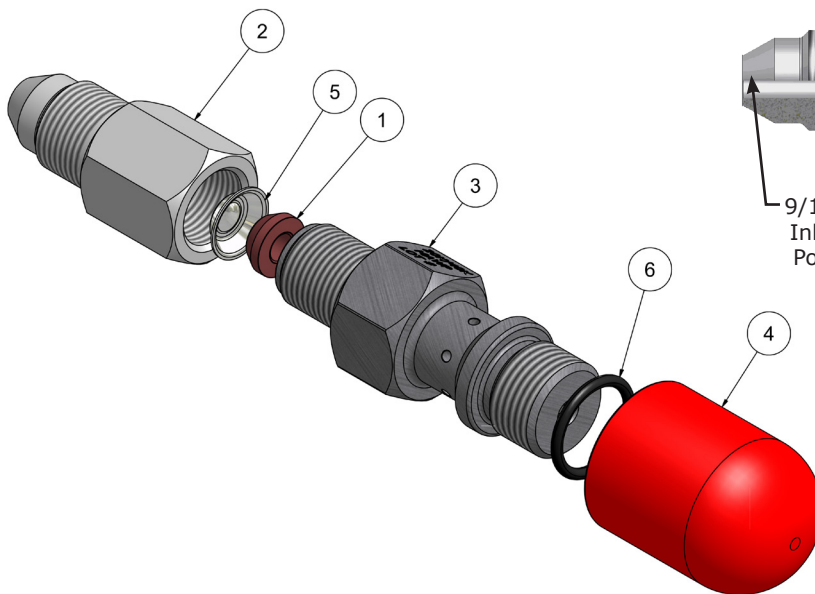
Part #	Description
43-010-001	21" GALVANIZED WIRE (1/8") & SS SPRINGS (1/2" - 1 1/4" HOSE)
43-010-002	NYLON W/RUBBER GROMMET STOPS (APP. 31-1/2" LONG)
43-010-003	STAINLESS, 38" CS PLATED WIRE (1/4") & SPRINGS (1-1/2" - 3" HOSE)
43-010-004	NYLON 2-PLY W/RUBBER GROMMET STOPS (APP. 64" LONG)
43-010-005	NYLON 2-PLY W/RUBBER GROMMET STOPS (APP. 44" LONG)

Pictured here are two typical whip check types, one is the stainless steel tension model, and the other is high-strength brightly-colored nylon with rubber cinch bands.

20K Rupture Disc Holder with Safety Shroud A Rupture Disc is an essential component in any system which contains a positive displacement pump. It provides protection against excessive pressure building up in the water blasting equipment connected to a pump. Advanced Pressure Systems has designed a rugged, compact Rupture Disc Holder, which offers safety features to prevent the use of coins or other disc substitutes, which may prove dangerous to operators or cause damage to the blasting equipment. The domed deflector minimizes spray in the event of a disc rupturing and the disc holder body is simple to remove for replacing a disc.



Part #	Description	PSI
35-008-010	9/16" MP RH Rupture Disc Assy.	20K Range



ITEM	PART #	DESCRIPTION
1	35-008-011	20/40K Rupture disc Hold Down Ring
2	35-008-012	9/16" MP 20K Rupture Disc Holder Body
3	35-008-013	20/40 K Rupture Disc Holder Nut
4	35-008-027	Rupture Disc Holder Shroud
5	Select Rupture Disc to suit operating pressure	
6	30-001-910	O-Ring 90 Dur

Part #	Description	
35-006-125	12.5K Burst 1/4 A/S	Rupture Disc
35-006-144	14.4K Burst 1/4 A/S	Rupture Disc
35-006-150	15K Burst 1/4 A/S W/TAG	Rupture Disc
35-006-175	17.5K Burst 1/4 A/S	Rupture Disc
35-006-180	18K Burst 1/4 A/S W/TAG	Rupture Disc
35-006-200	20K Burst 1/4 A/S	Rupture Disc
35-006-225	22.5K Burst 1/4 A/S (GDWJ TYPR: 3133023225)	Rupture Disc
35-006-240	24K Burst 1/4 A/S (GDWJ TYPR: 3133023240)	Rupture Disc
35-006-250	25K Burst 1/4 A/S (GDWJ TYPR: 3133023250)	Rupture Disc
35-006-260	26K Burst 1/4 A/S	Rupture Disc
35-006-270	27K Burst 1/4 A/S	Rupture Disc
35-006-290	29K Burst 1/4 A/S	Rupture Disc
35-017-240	24K 13/32" STD. (J/S TYPE: 51838)	Rupture Disc
35-017-270	27K 13/32" STD. (J/S TYPE: 51837)	Rupture Disc
35-017-290	29K 13/32" STD. (J/S TYPE: 51836)	Rupture Disc

20K Rupture Discs Advanced Pressure Systems offers a complete range of Rupture Discs for use in the Rupture Disc Holder. These discs will protect your personnel, pumps and associated equipment from over-pressuring. The standard range of disc bursting pressures are carefully selected to provide the ideal safety relief for all of your equipment. Special ratings can be provided upon request. Rupture discs for NLB & Jetstream equipment are also available to order.

WaterArmor Suits for Safety

At **APS** we understand the need for safety in any environment. The water blasting equipment produced at **APS** is designed with safety features. To protect the safety of the water blast technician during operation, we advise that extra safety precautions should be taken.

This is why we offer TurtleSkin WaterArmor.



Full Body Waterjet Suits

Part # 55-001-003 (Chaps & Torso Only)

Rugged and Lightweight Full Body Protection

Water jet operators appreciate the comfortable and easy-to-replace, hinged-panel design of lightweight TurtleSkin WaterArmor. The modular design allows any of the 19 individual components to be easily removed and replaced using common tools. The replacement of one or two individual parts is far less costly than the expense of purchasing a whole new suit.

TurtleSkin WaterArmor Torso

Part # 55-001-004

Upper Body Protection for Water Blasting Operators

Flexible, lightweight upper body protection that keeps the water jet operator's torso safe from potentially fatal water jet swipes.

TurtleSkin WaterArmor Chaps

Part # 55-001-005

Upper Leg Protection for Water Blasting Operators

Protective chaps for the upper legs that feature adjustable straps and thigh panels that can be lengthened or shortened to fit any size operator.

Water Blast Protective Gaiters

Part # 55-001-002

Flexible, Lightweight Water Blasting Foot Protection

Designed to protect the feet, shins, toes, and insteps, TurtleSkin WaterArmor Gaiters are constructed of hinged protective panels that flex with every step. These gaiters give water blasting operators the mobility to do their work and keep lower extremities safe from dangerous blasts.

Arm Protection Gauntlets

Part # 55-001-001 (Gloves Not Included)

Arm and Wrist Protection for Water Blasting Operators

TurtleSkin WaterArmor water jet protective gear is known for its flexibility, comfort, and toughness. The gauntlet covers the wrist, forearm, and back of the hand. Patented TurtleSkin features flexible layers constructed with the tightest weave of high-strength aramid.



ITEM	Description	
1	Vest Panel	Torso
2	Right Waist Panel	Torso
3	Belt	Chaps
4	Right Hip Panel	Chaps
5	Right Thigh Panel	Chaps
6	Right Knee	Chaps
7	Right Shin	Chaps
8	Left Waist Panel	Torso
9	Groin Guard	Torso
10	Left Hip Panel	Chaps

ITEM	Description	
11	Left Thigh Panel	Chaps
12	Left Knee	Chaps
13	Left Shin	Chaps
14	Right Gaiter Shin	Gaiters
15	Right Metatarsal	Gaiters
16	Toe	Gaiters
17	Left Gaiter Shin	Gaiters
18	Left Metatarsal	Gaiters
19	Ankle	Gaiters
20	Right Arm Gauntlets	Gauntlet
21	Left Arm Gauntlets	Gauntlet

High-Pressure Water Jet Testing Results:

The following conditions did not elicit penetration of the protective system with high-pressure water traveling at 8 feet/second (2.4 meters/second) at no closer than 3 inches (7.62 cm):

Pressure PSI (bar)	Flow Rate GPM (lpm)	Orifice ID Inches (mm)	0° Nozzle, Single Orifice: Material	Efficiency Factor *
40,000 (2,800)	5.5 (21)	0.035 (0.889)	Sapphire	22.4
36,000 (2,500)	5 (19)	0.035 (0.889)	Sapphire	21.5
20,000 (1,400)	11 (42)	0.051 (1.295)	Tungsten Carbide	29.9
10,000 (700)	16 (61)	0.073 (1.854)	Tungsten Carbide	30

* Efficiency Factor is equal to

Ultra High-Pressure Water Jet Safety and Performance

TurtleSkin WaterArmor uses an innovative, patented fabric to provide protection from high-pressure water jet injuries. Created by Warwick Mills, TurtleSkin is made from the tightest weave ever achieved in aramid, a fiber two times stronger and five times lighter than steel. TurtleSkin WaterArmor can protect ultra high-pressure water jet operators from pressures as high as 2800 bar (40,000 psi).

Protection up to 2800 bar or 40,000 psi

TurtleSkin WaterArmor personal protective waterjet equipment offers increased protection to ultra-high pressure water jet operators at all pressures at specified flow rates.

One Size Fits All Protection

TurtleSkin WaterArmor hydrodemolition protective suits are specifically designed for ultra-high pressure water jet safety. Every patented garment features adjustable straps, and the thigh panels on the chaps can be lengthened or shortened to fit any size operator.



LUBRICANTS, SEALANTS AND TAPE

Lubricants, Sealants and Tapes It is essential to keep the correct lubricants, sealants and Teflon® tapes on hand to guard against leaks and pressure loss, and to protect the threads on all water jetting components. **APS** keeps these things in stock as an added convenience for our customers. Our goal is to always be the first source you call.

Part #	Description	Size
24-001-001	Blue Goop® Thread Lubricant	2 Fl. Oz. Tube
24-001-002	Loctite® Nickel-Based Anti-Seize	1 Lb. Jar
24-001-003	Loctite® 567™ Thread Sealant	1.69 Fl. Oz.
24-001-004	1/2" White Teflon® Tape	520 Ft. Roll
24-001-005	3/4" White Teflon® Tape	520 Ft. Roll
24-001-006	1/2" Blue Monster® Premium Teflon®	1,429 Ft. Roll
24-001-007	3/4" Blue Monster® Premium Teflon® Tape	1,429 Ft. Roll
24-001-009	Jet-Lube 550	1/2 Lb. Jar
24-001-010	Jet-Lube 550	1 Lb. Jar
24-001-011	Yellow Lube®	6-6 Oz. sq tube
24-001-013	Loctite® Clover Compound, Grease Mix	16 Oz. Net WT
24-001-014	Loctite® Clover Compound, Water Mix	6-6 oz sq tube
24-001-020	Lubritech® Air Lube Airline Lubricants	16 Fl. Oz. Bottel
24-001-015	Lubemaster® Permalube 4099	14.8 Oz. Tube
24-001-020	LubriMatic® White Lithium Grease	16 Oz. Can

Blue Goop® Thread Lubricant (Excellent anti-seize lubricant, especially for 40K applications.) **Part# 24-001-001** Oil-based thread lubricant for use on stainless steel, steel, titanium, aluminum, and nickel-based alloys.



Loctite® Nickel-Based Anti-Seize Part# 24-001-002 A heavy duty, high temperature lubricant; it resists galling and corrosion, reduces wear in heavy pressure applications, contains oils and graphite which cannot be burned away or be removed by slow moving parts.



Loctite® Clover Compound, Grease Mix Part# 24-001-013 Silicon carbide particles in a grease mix. Perfect for smoothing and finishing of metal surfaces. Retains its texture and lubrication properties during extended use. Uses include cleaning corroded threads, valve rebuilding, smoothing gears, removing tool marks, lapping for flatness.



1/2" Blue Monster® Premium Teflon® Part# 24-001-006 Blue Monster is rugged, not flimsy like most thread seal tapes on the market. Blue Monster has not been stretched during the manufacturing process, so it is thicker and creates a more effective seal with less tape. Blue Monster could be used in conjunction with # 24-001-003 Loctite® Thread Sealant for all NPT Threads.



Jet-Lube 550 1 LB. Net WT. Part# 24-001-010 1/2 LB. Net WT. Part# 24-001-009 550 contains carefully balanced proportions of molybdenum disulphide (MoS₂), graphite, and low friction fillers in an aluminum complex base grease that is fortified with effective rust and corrosion inhibitors. 550 assures protection against rust, oxidation and corrosion. It will not harden, evaporate, or settle out; and it requires no thinning. 550 is the ideal product for petrochemical plants' maintenance needs.

Applications: Threads, Flange Faces, Keyways, Gaskets. Slides, Guides and Fittings



LubriMatic® White Lithium Grease Part# 24-001-016 Includes zinc additive for a clean, white color. Ideal for general home, shop, automotive, agricultural and industrial applications. NLGI #2, drop point 393 Deg. F.



Loctite® 567™ Thread Sealant (Designed for the locking and sealing of tapered metal threads & fittings NPT.) **Part# 24-001-003** Designed for the locking and sealing of metal tapered threads and fittings. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. The high lubricating properties of this compound prevent galling on stainless steel, aluminum and all other metal pipe threads and fittings.



Yellow Lube
6 oz. tube/cs Part# 24-001-011
3 oz. tube/cs Part# 24-001-023 (Very good general purpose anti-seize lubricant which also helps to seal tapered threads.) Yellow Lube is a thread compound employing a heavy duty sulfur/phosphorus extreme pressure additive package for a variety of types and combinations of metals. Galling of threads is virtually impossible.



Loctite® Clover Compound, Water Mix Part# 24-001-014 Paste formulation for fast metal removal. Biodegradable, recommended for applications where cleanup with water is required.



White 1/2 Teflon® Tape 520 Ft. Roll Part# 24-001-004
White 3/4 Teflon® Tape 520 Ft. Roll Part# 24-001-005
The use of Teflon Tape on MPT fittings will help to prevent leaks.



Lubritech® Air Lube Airline Lubricants Part# 24-001-020 Air Lube Airline Lubricants are formulated specifically to absorb the moisture present in compressed air used in pneumatic tools, air motors and cylinders. They contain a unique emulsifier system designed to encapsulate up to 10% of its weight in water, while corrosion inhibitors form a protective film on metal surfaces, preventing oxidation and rust formation. Made from highly thermally stable base stocks, these hard-working lubricants help eliminate varnish formation and associated valve sticking. Air Lube Airline Lubricants will not leave hard carbon deposits or effect rubber or plastic valves and seals.



Lubemaster® Permalube 4099 (Tube) Part# 24-001-015 This grease is for the Cobra Gun.



YOU ARE RESPONSIBLE FOR SAFETY!

Advanced Pressure Systems publishes guides for the safe use of Water Blasting Equipment.

Please READ them!

We also strongly advise that all personnel are fully conversant with:

***"Recommended Practices for the Use of
Manually Operated High Pressure Water Jetting Equipment"***
published by the Water Jet Technology Association.



These may be obtained free of charge by contacting:
ADVANCED PRESSURE SYSTEMS, L.P. (877) 290-4277

Conditions of Sale & Warranty

General - These terms and conditions and warranty provisions are applicable to all products contained in this catalog, and may not be varied, except in writing by a partner of APS Pressure Systems L.P.

Terms of Sale –

- 1) All sales are FOB manufacturers plant, Houston, Texas, and are priced and must be paid for in US dollars.
- 2) The purchaser agrees to hold APS Pressure Systems (DBA: Advanced Pressure Systems) harmless for any and all claims arising from the misuse or misapplication of any product manufactured or supplied by Advanced Pressure Systems.
- 3) Products returned for credit will be subject to 15% restocking charge. Only standard products will be accepted for restocking. All sales of non-standard items are final.
- 4) Payment may be made by credit cards issued by VISA or MASTERCARD. Payment by credit cards issued by AMERICAN EXPRESS will be subject to 3% service charge.

Warranty - The following classes of products carry the warranty indicated. Any component included in an assembled product which is subject to wear is not warranted. Products which have been subject to abuse including misapplication, corrosion, excessive pressure, over-tightening and galling of screw threads will not be accepted for replacement under warranty. Products not manufactured by Advanced Pressure Systems will carry the warranty of the respective manufacturer

Hose - Not warranted. Coupling may be warranted by manufacturer.

Rigid Lances - Ninety days from date of shipment.

Plungers and Pump Packing - Not warranted.

Control Guns, Flow Divider Valves, Flow Control Valves - Ninety days from date of shipment.

Relief Valves - 180 days from date of shipment.

Nozzles and nozzle inserts / orifices - Not warranted

Fittings, Connectors and Couplings - 180 days from date of shipment.

Shipping Costs - Orders may be shipped prepaid by any regularly available means, and the cost will be paid by the customer. Other shipping costs including but not limited to: insurance for the full retail value of the products, packaging, crating and any other handling costs will be billed to the customer. If the customer collects the products from the Houston plant there will not be any shipping charges.

Payment - All invoices are due net 30 days from date of shipment. Any invoices which are more than 30 days past due will result in the account of the customer concerned to be placed on hold.

PRODUCT INDEX

10-001-100 Page 13	16-002-001 Page 1	16-200-073 Page 2	17-002-025 Page 3	17-026-028 Page 1	21-002-003 Page 15
10-001-100 Page 14	16-002-101 Page 1	16-200-075 Page 2	17-002-028 Page 3	17-026-031 Page 1	21-002-004 Page 8
10-001-100 Page 15	16-002-221 Page 1	16-201-035 Page 2	17-002-029 Page 3	17-026-036 Page 1	21-002-005 Page 8
10-001-112 Page 17	16-003-001 Page 1	16-201-043 Page 2	17-002-031 Page 3	17-026-041 Page 1	21-003-001 Page 8
10-001-125 Page 12	16-003-101 Page 1	16-201-045 Page 2	17-002-033 Page 3	17-026-043 Page 1	21-003-002 Page 8
10-001-125 Page 17	16-003-221 Page 1	16-201-049 Page 2	17-002-034 Page 3	17-026-047 Page 1	21-003-003 Page 8
10-001-150 Page 12	16-004-001 Page 1	16-201-051 Page 2	17-002-035 Page 3	17-026-051 Page 1	21-003-003 Page 13
10-001-200 Page 17	16-004-001 Page 1	16-201-061 Page 2	17-002-036 Page 3	17-026-055 Page 1	21-003-003 Page 14
10-002-050 Page 12	16-004-101 Page 1	16-201-063 Page 2	17-003-000 Page 4	17-026-059 Page 1	21-003-003 Page 15
10-002-150 Page 18	16-005-001 Page 1	16-201-075 Page 2	17-003-001 Page 4	17-026-062 Page 1	21-003-004 Page 8
10-010-001 Page 13	16-005-001 Page 1	17-001-000 Page 3	17-003-007 Page 4	17-026-067 Page 1	21-003-005 Page 8
10-010-001 Page 14	16-005-101 Page 1	17-001-007 Page 3	17-003-008 Page 4	17-026-075 Page 1	21-004-001 Page 8
10-010-001 Page 15	16-006-001 Page 1	17-001-008 Page 3	17-003-009 Page 4	17-101-011 Page 3	21-004-002 Page 8
10-010-002 Page 13	16-006-001 Page 1	17-001-009 Page 3	17-003-010 Page 4	17-101-012 Page 3	21-004-003 Page 8
10-010-002 Page 14	16-006-101 Page 1	17-001-010 Page 3	17-003-011 Page 4	17-101-013 Page 3	21-004-004 Page 8
10-010-003 Page 12	16-010-001 Page 1	17-001-011 Page 3	17-003-012 Page 4	17-101-014 Page 3	21-004-005 Page 8
10-015-150 Page 12	16-010-101 Page 1	17-001-012 Page 3	17-003-013 Page 4	17-101-015 Page 3	21-005-001 Page 9
10-015-250 Page 12	16-020-001 Page 1	17-001-013 Page 3	17-003-014 Page 4	17-101-016 Page 3	21-005-002 Page 9
10-016-075 Page 14	16-020-002 Page 1	17-001-014 Page 3	17-003-015 Page 4	17-101-017 Page 3	21-005-003 Page 9
10-016-075 Page 18	16-020-003 Page 1	17-001-015 Page 3	17-003-016 Page 4	17-101-018 Page 3	21-005-003 Page 13
10-016-075 Page 19	16-020-004 Page 1	17-001-016 Page 3	17-003-018 Page 4	17-101-019 Page 3	21-005-003 Page 14
10-017-250 Page 13	16-020-005 Page 1	17-001-017 Page 3	17-003-019 Page 4	17-101-020 Page 3	21-005-003 Page 15
10-017-250 Page 14	16-020-006 Page 1	17-001-018 Page 3	17-003-020 Page 4	17-101-021 Page 3	21-005-004 Page 9
10-020-001 Page 12	16-020-009 Page 1	17-001-019 Page 3	17-003-021 Page 4	17-101-022 Page 3	21-005-005 Page 9
10-020-002 Page 12	16-025-001 Page 2	17-001-020 Page 3	17-003-022 Page 4	17-101-023 Page 3	21-007-001 Page 8
10-022-031 Page 12	16-025-002 Page 2	17-001-021 Page 3	17-003-025 Page 4	17-101-024 Page 3	21-007-001 Page 8
10-024-150 Page 12	16-025-003 Page 2	17-001-022 Page 3	17-003-026 Page 4	17-101-025 Page 3	21-007-002 Page 8
10-060-275 Page 12	16-025-004 Page 2	17-001-023 Page 3	17-003-027 Page 4	17-101-026 Page 3	21-007-002 Page 8
10-100-002 Page 13	16-025-005 Page 2	17-001-024 Page 3	17-003-028 Page 4	17-101-027 Page 3	21-007-003 Page 8
10-100-002 Page 15	16-025-006 Page 2	17-001-025 Page 3	17-003-031 Page 4	17-101-028 Page 3	21-007-003 Page 8
10-100-003 Page 12	16-025-007 Page 2	17-001-026 Page 3	17-003-032 Page 4	17-101-029 Page 3	21-007-004 Page 8
10-100-003 Page 13	16-025-009 Page 2	17-001-027 Page 3	17-003-033 Page 4	17-101-030 Page 3	21-007-004 Page 8
10-100-003 Page 14	16-025-010 Page 2	17-001-028 Page 3	17-003-034 Page 4	17-101-031 Page 3	21-007-005 Page 8
10-100-006 Page 12	16-025-020 Page 2	17-001-029 Page 3	17-003-035 Page 4	17-101-032 Page 3	21-007-005 Page 8
10-121-325 Page 12	16-025-107 Page 2	17-001-031 Page 3	17-003-036 Page 4	17-101-033 Page 3	21-007-006 Page 8
10-201-063 Page 16	16-025-112 Page 2	17-001-034 Page 3	17-003-038 Page 4	17-101-034 Page 3	21-007-006 Page 8
10-201-175 Page 17	16-025-116 Page 2	17-001-035 Page 3	17-006-001 Page 3	17-101-035 Page 3	21-007-007 Page 8
15-070-001 Page 4	16-025-117 Page 2	17-001-036 Page 3	17-010-008 Page 3	17-101-036 Page 3	21-007-007 Page 8
15-070-003 Page 4	16-025-119 Page 2	17-001-037 Page 3	17-010-009 Page 3	17-101-037 Page 3	21-007-008 Page 8
15-070-004 Page 4	16-200-024 Page 2	17-001-038 Page 3	17-010-010 Page 3	17-101-038 Page 3	21-007-008 Page 8
15-070-004 Page 4	16-200-026 Page 2	17-001-039 Page 3	17-010-100 Page 3	17-101-039 Page 3	21-007-009 Page 8
15-070-011 Page 4	16-200-028 Page 2	17-001-040 Page 3	17-010-100 Page 3	17-101-040 Page 3	21-007-009 Page 8
15-070-013 Page 4	16-200-030 Page 2	17-001-043 Page 3	17-025-000 Page 1	17-101-041 Page 3	21-007-010 Page 8
15-071-001 Page 4	16-200-031 Page 2	17-001-050 Page 3	17-025-000 Page 13	17-101-042 Page 3	21-007-010 Page 8
15-071-003 Page 4	16-200-033 Page 2	17-001-051 Page 3	17-025-000 Page 14	17-101-043 Page 3	21-007-011 Page 8
15-071-004 Page 4	16-200-035 Page 2	17-001-052 Page 3	17-025-001 Page 1	17-101-044 Page 3	21-007-012 Page 8
15-071-005 Page 4	16-200-037 Page 2	17-001-056 Page 3	17-025-002 Page 1	17-101-045 Page 3	21-007-013 Page 8
15-071-011 Page 4	16-200-039 Page 2	17-002-007 Page 3	17-025-021 Page 1	17-101-046 Page 3	21-007-014 Page 8
15-071-013 Page 4	16-200-041 Page 2	17-002-008 Page 3	17-025-024 Page 1	17-101-047 Page 3	21-007-015 Page 8
15-072-001 Page 4	16-200-043 Page 2	17-002-009 Page 3	17-025-026 Page 1	17-101-048 Page 3	21-007-016 Page 8
15-072-002 Page 4	16-200-045 Page 2	17-002-010 Page 3	17-025-028 Page 1	17-101-049 Page 3	21-007-017 Page 8
15-072-003 Page 4	16-200-047 Page 2	17-002-011 Page 3	17-025-031 Page 1	17-101-050 Page 3	21-007-018 Page 8
15-072-003 Page 4	16-200-049 Page 2	17-002-012 Page 3	17-025-036 Page 1	17-101-051 Page 3	21-007-020 Page 8
15-072-004 Page 4	16-200-051 Page 2	17-002-013 Page 3	17-025-041 Page 1	17-101-052 Page 3	21-007-021 Page 8
15-072-004 Page 4	16-200-053 Page 2	17-002-014 Page 3	17-025-043 Page 1	20-002-004 Page 15	21-007-022 Page 8
15-072-005 Page 4	16-200-055 Page 2	17-002-015 Page 3	17-025-047 Page 1	20-022-010 Page 15	21-007-023 Page 9
15-072-005 Page 4	16-200-057 Page 2	17-002-016 Page 3	17-025-051 Page 1	20-028-101 Page 13	21-007-024 Page 9
15-072-011 Page 4	16-200-059 Page 2	17-002-017 Page 3	17-025-055 Page 1	20-028-101 Page 15	21-007-025 Page 9
15-072-012 Page 4	16-200-061 Page 2	17-002-018 Page 3	17-025-059 Page 1	21-002-001 Page 8	21-007-026 Page 9
15-072-013 Page 4	16-200-063 Page 2	17-002-019 Page 3	17-025-062 Page 1	21-002-002 Page 8	21-007-027 Page 9
15-072-013 Page 4	16-200-065 Page 2	17-002-020 Page 3	17-025-076 Page 1	21-002-003 Page 8	21-007-028 Page 9
16-001-001 Page 1	16-200-067 Page 2	17-002-021 Page 3	17-026-021 Page 1	21-002-003 Page 13	21-007-030 Page 8
16-001-101 Page 1	16-200-069 Page 2	17-002-022 Page 3	17-026-024 Page 1	21-002-003 Page 14	21-007-034 Page 8
16-001-221 Page 1	16-200-071 Page 2	17-002-023 Page 3	17-026-026 Page 1	21-002-003 Page 15	21-007-034 Page 8

PRODUCT INDEX

21-007-037.....	Page 8	21-015-004.....	Page 9	21-024-048.....	Page 10	35-009-000.....	Page 11	44-021-009.....	Page 21	61-010-006.....	Page 17
21-007-037.....	Page 8	21-015-005.....	Page 9	21-025-001.....	Page 8	35-009-001.....	Page 11	44-021-050.....	Page 21	61-010-007.....	Page 16
21-007-038.....	Page 8	21-015-006.....	Page 9	21-025-002.....	Page 8	35-009-002.....	Page 11	44-021-054.....	Page 21	61-020-001.....	Page 16
21-007-043.....	Page 8	21-015-007.....	Page 9	21-025-003.....	Page 8	35-009-003.....	Page 11	44-021-055.....	Page 21	61-020-001.....	Page 17
21-007-044.....	Page 8	21-015-008.....	Page 9	21-025-004.....	Page 8	35-009-004.....	Page 11	55-001-001.....	Page 22	61-020-002.....	Page 16
21-007-044.....	Page 8	21-016-001.....	Page 9	21-025-005.....	Page 8	35-009-005.....	Page 11	55-001-002.....	Page 22	61-020-002.....	Page 17
21-007-045.....	Page 9	21-016-002.....	Page 9	21-025-006.....	Page 8	35-009-006.....	Page 11	55-001-003.....	Page 22	61-020-003.....	Page 16
21-007-057.....	Page 8	21-016-003.....	Page 9	21-025-007.....	Page 8	35-009-007.....	Page 11	55-001-004.....	Page 22	61-020-004.....	Page 16
21-007-063.....	Page 8	21-016-004.....	Page 9	21-025-008.....	Page 8	35-009-010.....	Page 11	55-001-005.....	Page 22	61-020-004.....	Page 17
21-007-063.....	Page 9	21-016-005.....	Page 9	21-025-009.....	Page 8	35-009-011.....	Page 11	60-010-001.....	Page 13	61-020-005.....	Page 16
21-007-073.....	Page 8	21-016-006.....	Page 9	21-025-010.....	Page 8	35-009-012.....	Page 11	60-010-001.....	Page 14	61-020-005.....	Page 17
21-007-114.....	Page 9	21-016-007.....	Page 9	21-030-001.....	Page 11	35-009-013.....	Page 11	60-010-001.....	Page 15	61-020-010.....	Page 11
21-007-157.....	Page 8	21-016-008.....	Page 9	21-030-002.....	Page 11	35-009-014.....	Page 11	60-010-003.....	Page 13	61-020-019.....	Page 17
21-007-173.....	Page 9	21-016-010.....	Page 9	21-030-003.....	Page 11	35-017-240.....	Page 22	60-010-003.....	Page 14	65-020-005.....	Page 19
21-008-001.....	Page 8	21-016-011.....	Page 9	21-030-004.....	Page 11	35-017-270.....	Page 22	60-010-005.....	Page 13	65-110-003.....	Page 19
21-008-002.....	Page 8	21-016-012.....	Page 9	21-030-005.....	Page 11	35-017-290.....	Page 22	60-010-005.....	Page 15	65-120-003.....	Page 19
21-008-003.....	Page 8	21-016-013.....	Page 9	21-030-006.....	Page 11	36-015-007.1.....	Page 12	60-010-009.....	Page 13	65-120-003.....	Page 20
21-008-004.....	Page 8	21-016-014.....	Page 9	24-001-001.....	Page 25	36-015-007.2.....	Page 12	60-010-009.....	Page 14	65-120-004.....	Page 20
21-008-005.....	Page 8	21-016-015.....	Page 9	24-001-002.....	Page 25	36-015-016.....	Page 12	60-010-017.....	Page 13	65-120-005.....	Page 20
21-008-006.....	Page 8	21-016-016.....	Page 9	24-001-003.....	Page 25	36-015-018.1.....	Page 12	60-010-017.....	Page 14	65-120-006.....	Page 20
21-008-007.....	Page 8	21-016-017.....	Page 9	24-001-004.....	Page 25	36-015-019.....	Page 12	60-010-021.....	Page 13	65-120-007.....	Page 20
21-008-008.....	Page 8	21-016-018.....	Page 9	24-001-005.....	Page 25	36-015-023.....	Page 12	60-010-021.....	Page 14	65-120-008.....	Page 20
21-008-009.....	Page 8	21-020-003.....	Page 10	24-001-006.....	Page 25	36-015-025.....	Page 12	60-010-021.....	Page 15	65-120-009.....	Page 20
21-009-001.....	Page 8	21-020-006.....	Page 10	24-001-007.....	Page 25	36-015-026.....	Page 12	60-010-032.....	Page 15	65-120-011.....	Page 20
21-009-002.....	Page 8	21-020-008.....	Page 10	24-001-009.....	Page 25	36-015-027.....	Page 12	60-010-033.....	Page 15	65-120-015.....	Page 19
21-009-003.....	Page 8	21-020-010.....	Page 10	24-001-010.....	Page 25	36-015-028.....	Page 12	60-010-057.....	Page 13	65-120-015.....	Page 20
21-009-004.....	Page 8	21-020-012.....	Page 10	24-001-011.....	Page 25	36-015-031.....	Page 12	60-010-057.....	Page 14	65-120-016.....	Page 20
21-009-005.....	Page 8	21-020-024.....	Page 10	24-001-013.....	Page 25	36-015-032.....	Page 12	60-010-057.....	Page 15	65-120-017.....	Page 20
21-010-001.....	Page 9	21-020-036.....	Page 10	24-001-014.....	Page 25	36-015-033.....	Page 12	60-010-061.....	Page 13	65-120-018.....	Page 20
21-010-002.....	Page 9	21-020-048.....	Page 10	24-001-015.....	Page 25	36-015-034.....	Page 12	60-010-061.....	Page 14	65-120-019.....	Page 20
21-010-003.....	Page 9	21-021-003.....	Page 10	24-001-020.....	Page 25	36-015-035.....	Page 12	60-010-061.....	Page 15	65-120-020.....	Page 20
21-010-004.....	Page 9	21-021-006.....	Page 10	24-001-020.....	Page 25	36-015-044.....	Page 12	60-020-001.....	Page 15	65-120-021.....	Page 20
21-010-005.....	Page 9	21-021-008.....	Page 10	30-001-009.....	Page 16	36-015-046.....	Page 12	60-020-005.....	Page 13	65-120-022.....	Page 20
21-010-103.....	Page 15	21-021-010.....	Page 10	30-001-009.....	Page 17	36-015-068.....	Page 12	60-020-005.....	Page 14	65-120-023.....	Page 20
21-012-001.....	Page 8	21-021-012.....	Page 10	30-001-010.....	Page 1	36-015-069.....	Page 12	60-020-006.....	Page 13	65-120-024.....	Page 20
21-012-002.....	Page 8	21-021-024.....	Page 10	30-001-010.....	Page 14	36-015-070.....	Page 12	60-020-007.....	Page 13	65-120-025.....	Page 20
21-012-003.....	Page 8	21-021-036.....	Page 10	30-001-018.....	Page 18	36-015-071.....	Page 12	60-020-007.....	Page 14	65-120-026.....	Page 20
21-012-004.....	Page 8	21-021-048.....	Page 10	30-001-018.....	Page 19	36-015-072.....	Page 12	60-020-008.....	Page 13	65-120-027.....	Page 20
21-012-005.....	Page 8	21-022-003.....	Page 10	30-001-029.....	Page 19	36-015-073.....	Page 12	60-020-008.....	Page 15	65-120-028.....	Page 20
21-012-006.....	Page 8	21-022-006.....	Page 10	30-001-121.....	Page 19	36-015-074.....	Page 12	60-020-009.....	Page 13	65-120-029.....	Page 20
21-012-007.....	Page 8	21-022-008.....	Page 10	30-001-122.....	Page 18	36-015-075.....	Page 12	60-020-009.....	Page 15	65-120-030.....	Page 20
21-012-008.....	Page 8	21-022-008.....	Page 15	30-001-910.....	Page 22	36-015-076.....	Page 12	60-020-010.....	Page 13	65-120-031.....	Page 20
21-012-009.....	Page 8	21-022-010.....	Page 10	30-002-126.....	Page 12	36-015-077.....	Page 12	60-020-010.....	Page 14	65-120-031.....	Page 20
21-012-010.....	Page 8	21-022-010.....	Page 14	30-003-121.....	Page 19	36-015-080.....	Page 12	60-020-010.....	Page 15	65-120-035.....	Page 20
21-012-103.....	Page 13	21-022-010.....	Page 15	30-008-010.....	Page 8	36-015-081.....	Page 12	60-020-010.....	Page 16	70-010-013.....	Page 18
21-012-103.....	Page 14	21-022-012.....	Page 10	30-008-012.....	Page 8	36-015-082-3.....	Page 12	60-020-010.....	Page 17	70-010-013.....	Page 19
21-013-001.....	Page 9	21-022-024.....	Page 10	35-001-005.....	Page 21	36-015-084.....	Page 12	60-020-012.....	Page 13	70-010-019.....	Page 19
21-013-002.....	Page 9	21-022-036.....	Page 10	35-001-006.....	Page 21	36-015-087.....	Page 12	60-020-012.....	Page 14	70-020-011.....	Page 18
21-013-003.....	Page 9	21-022-036.....	Page 14	35-006-125.....	Page 22	36-015-088.....	Page 12	60-020-013.....	Page 15	70-020-011.....	Page 19
21-013-004.....	Page 9	21-022-036.....	Page 15	35-006-144.....	Page 22	36-015-089.....	Page 12	60-020-014.....	Page 13	70-022-004.....	Page 18
21-013-005.....	Page 9	21-022-048.....	Page 10	35-006-150.....	Page 22	36-015-159.....	Page 12	60-020-014.....	Page 14	70-022-009.....	Page 18
21-013-006.....	Page 9	21-022-048.....	Page 13	35-006-175.....	Page 22	36-015-160.....	Page 12	60-020-015.....	Page 15	70-022-013.....	Page 18
21-013-007.....	Page 9	21-022-060.....	Page 10	35-006-180.....	Page 22	36-015-161.....	Page 12	60-020-106.....	Page 13	70-022-014.....	Page 18
21-013-008.....	Page 9	21-023-006.....	Page 10	35-006-200.....	Page 22	36-015-162.....	Page 12	60-050-002.....	Page 14	70-032-001.....	Page 18
21-014-001.....	Page 9	21-023-008.....	Page 10	35-006-225.....	Page 22	36-015-163.....	Page 12	60-050-003.....	Page 14	70-032-002.....	Page 18
21-014-002.....	Page 9	21-023-010.....	Page 10	35-006-240.....	Page 22	43-010-001.....	Page 22	60-050-005.....	Page 14	70-032-003.....	Page 18
21-014-003.....	Page 9	21-023-012.....	Page 10	35-006-250.....	Page 22	43-010-002.....	Page 22	60-055-001.....	Page 14	70-032-016.....	Page 18
21-014-004.....	Page 9	21-023-048.....	Page 10	35-006-260.....	Page 22	43-010-003.....	Page 22	61-001-002.....	Page 17	70-032-017.....	Page 18
21-014-005.....	Page 9	21-024-006.....	Page 10	35-006-270.....	Page 22	43-010-004.....	Page 22	61-001-003.....	Page 17	70-032-018.....	Page 18
21-014-006.....	Page 9	21-024-008.....	Page 10	35-006-290.....	Page 22	43-010-005.....	Page 22	61-001-004.....	Page 17	70-110-008.....	Page 18
21-014-007.....	Page 9	21-024-010.....	Page 10	35-008-011.....	Page 22	44-021-001.....	Page 21	61-002-001.....	Page 17	70-110-008.....	Page 19
21-015-001.....	Page 9	21-024-012.....	Page 10	35-008-012.....	Page 22	44-021-002.....	Page 21	61-010-002.....	Page 16	70-110-009.....	Page 19
21-015-002.....	Page 9	21-024-024.....	Page 10	35-008-013.....	Page 22	44-021-003.....	Page 21	61-010-002.....	Page 17	70-120-015.....	Page 19
21-015-003.....	Page 9	21-024-036.....	Page 10	35-008-027.....	Page 22	44-021-004.....	Page 21	61-010-004.....	Page 16		