

Innovations in Drill Stem Safety Valve Technology



**One-piece and
Two-piece Kelly Valves**

Safety Valves

Drop-in Check Valves

**Inside Blowout
Preventers**

Cup Testers

Drill Stem Subs

**Reverse Flow
Check Valves**



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Why do people choose Packard International?

Technical Excellence

Packard International drill stem products are built to meet or exceed industry standard specifications.

Cost Effectiveness

Because Packard International has less overhead costs than many of its competitors and management of resources is extremely efficient, Packard can offer extremely competitive pricing.

Reliability

Packard's stringent quality control, computer and real-time testing ensure that each drill string product will meet or exceed field requirements.

Outstanding Service

At Packard International, we pride ourselves on a personal approach to service. You can always count on us to be there when you need us.

Speedy Delivery

Packard International understands that downtime is one thing you really don't need. That's why Packard offers much faster delivery times than most of our competitors.

Engineering Flexibility

Our products are tailored to your drilling needs. If you need it, we can make it.



API # 7-1-0207



ISO9001:2008 # 0163



Q1-0161



1999 and 2002

About Packard International

Driven to Succeed.

Recently listed as one of Houston's 100 fastest growing companies by the UH Small Business Development Center, Packard International attributes its meteoric rise in success to an unwavering commitment to customer satisfaction. Packard International strives for excellence in every aspect of its business, from its highly qualified staff to its state-of-the-art machining equipment.

Starting Small. Thinking Large.

When R. W. Nabors opened his small machine shop in 1975, little did he imagine that the company that began in a garage in Conroe, Texas would become respected internationally for the quality of its drill stem safety valve products. Since incorporating as Packard International in 1983, the company has expanded into a 12,000-square-foot precision manufacturing facility.

Looking to the Future.

Not satisfied with merely meeting standards, Packard International designs and manufactures its own line of innovative drill stem products that include kelly and safety valves, top drive valves, drop-in check valves, cup testers, rotary subs, and inside blowout preventers. Packard International is known for products that not only do the job, but do it with added reliability and efficiency.

Respecting the Past.

In addition to Packard International's own innovative products, in March of 2004, Packard became the sole producer of OMSCO's line of kelly valve products. Now the valves that set the standard by which all other kelly valves have been judged since 1945 are available exclusively from Packard International.

Continued Commitment to Quality.

Packard International's customers work in an industry that demands a lot of them, and they demand a lot of their equipment. That's why, in an ongoing effort to provide more capacity, capability, and repeatability,

Packard International's highly trained programming technicians, machinists, and engineers utilize only the latest software and precision machining technology to manufacture its products.

See What We're All About.

Packard International's facilities are located in a wooded community just north of Houston. The comfortable, relaxed atmosphere offers customers the perfect opportunity to discuss their equipment needs away from the stress of the city. We invite you to visit us today to learn how Packard International's drill stem products can improve your operation.



KV-1 One-piece Kelly Valves

Applications

The KV-1, Packard International's innovative, one-piece kelly valve, is designed to provide a positive seal in the event of a kick and can be used as an upper kelly valve, lower kelly valve, safety valve, or mud saver.

Features and Benefits

Compact Size

Approximately half the weight and length of some kelly valves, most of the KV-1s can easily be handled by one person. The compact body design saves space, and its full bore allows the unrestricted flow of drilling fluid — reducing wear on critical parts while providing unrestricted access for downhole tools.

Connection Flexibility

The KV-1 can be provided with left-hand connections compatible with the swivel and upper kelly connections, as well as connections compatible with the lower kelly connections and any mating tool joints. Many proprietary threads are available upon request.

Packard International's KV-1 is built with enough length on each end to allow fully recutting the connections in the event of damage to the threads or shoulders where sealing takes place.

High and Low Pressure Sealing

High and low pressure sealing is assured by the metal-to-metal sealing of the ball and seats of the KV-1. The ball and lower seat float while the upper seat is fixed in the body. This floating/fixed design aids in low pressure sealing and enables the operator to pressure balance the valve when opening it under partial pressure. The KV-1 is available up to 15,000 psi working pressures (22,500 psi hydrostatic test pressure).

H₂S Operation

All internal components are H₂S resistant. The optional valve bodies comply with NACE standard MR0175.

Traceability

All valve bodies, internal components, proprietary threads, OD/ID Coating or plating, cold working of threads and other special requests are fully traceable. Certificates are included in data books accompanying the valves upon request.



Maintenance

Packard International's KV-1 requires very little maintenance and complete disassembly and assembly is accomplished without torquing equipment. All internal parts in the same inside diameter size valve are interchangeable and are replaceable through the box end connection.

The KV-1 does not require routine lubrication; however, internal parts should be greased during all assembly operations. When the valve is disassembled all seals should be replaced. The seals should be replaced every six to nine months depending upon the type of

service the valve experiences. For complete maintenance instructions and valve specifications, please phone 281-399-8771 or e-mail support@packardint.com.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773. When ordering please specify: (1) the requested OD, ID, connections, and pressure rating or (2) the part number.

KV-1 One-piece Kelly Valve Specifications						
Complete Valve		110-334114-15	110-434134-17	110-538214-17	110-658213-19	110-734316-06LH
Size, Connection, & Weight		3-3/4" OD 2-3/8" IF (43 lb)	4-3/4" OD 3-1/2" IF (72 lb)	5-3/4" OD 3-1/2" IF (96 lb)	6-5/8" OD 4-1/2" IF (164 lb)	7-3/4" OD 6-5/8" REG LH (226 lb)
Valve Components	Quantity	1-1/4" ID	1-3/4" ID	2-1/4" ID	2-13/16" ID	3-1/16" ID
Snap Ring	1	WHT-168-S05	WHT-231-S02	WHT-287-S02	WHT-362-S02	WHT-387-S02
Solid Retainer Ring	1	100086 (0.15 lb)	100057 (0.17 lb)	100047 (0.2 lb)	100038 (0.3 lb)	100028 (0.6 lb)
Upper Split Retainer Ring	1	100084 (0.75 lb)	100055 (0.75 lb)	100045 (0.75 lb)	100036 (1.3 lb)	100026 (2 lb)
Upper Seat*	1	100082 (0.7 lb)	100053 (1 lb)	100043 (1.7 lb)	100034 (2.5 lb)	100024 (4 lb)
Upper Seat O-Ring: 568-337 BUNA 70*/**	1	70-568-033	70-568-333	70-568-337	70-568-344	70-568-347
Upper Seat B/U Ring: 8-337 BUNA 90*/**	2	90-8-033	90-8-333	90-8-337	90-8-344	90-8-347
Lower Split Retainer Ring	1	100085 (0.3 lb)	100056 (0.3 lb)	100046 (0.3 lb)	100037 (0.7 lb)	100027 (1 lb)
Ball*	1	100080 (0.64 lb)	100051 (1.5 lb)	100042 (2.5 lb)	100033 (4.2 lb)	100022 (5.5 lb)
Lower Seat*	1	100083 (1 lb)	100054 (1.2 lb)	100044 (1.7 lb)	100035 (3.1 lb)	100025 (4.1 lb)
Lower Seat O-Ring: 568-231 BUNA 70*/**	1	70-568-029	70-568-226	70-568-231	70-568-236	70-568-239
Lower Seat B/U Ring: 8-231 BUNA 90*/**	2	90-8-029	90-8-226	90-8-231	90-8-236	90-8-239
Spring*	3	SSR-0200-S17	SSR-0275-S17	SSR-0337-S17	SSR-0425-S17	SSR-0462-S17
Body	1	110-334114-15B	110-434134-17B	110-538214-17B	110-658213-19B	110-734316-06LHB
Operating Stem	1	100114 (0.1 lb)	100134 (0.1 lb)	100214 (0.34 lb)	100213 (0.2 lb)	100316 (0.52 lb)
Stem O-Ring: 568-218 BUNA 708*/**	1	70-568-020	70-568-218	70-568-218	70-568-218	70-568-218
Stem B/U Ring: 8-218 BUNA 90*/**	2	90-8-020	90-8-218	90-8-218	90-8-218	90-8-218
Operating Wrench	1	KVW-034-LA	KVW-034-LA	KVW-034-LA	KVW-034-LA	KVW-034-LA
Seal Kit		114-SK	134-SK	214-SK	213-SK	316-SK
Repair Kit		114-RK (4.2 lb)	134-RK (5.6 lb)	214-RK (8 lb)	213-RK (12.9 lb)	316-RK (18.32 lb)
Assembly & Disassembly Tool		114-ADT	134-ADT	214-ADT	213-ADT	316-ADT

*Parts included in the Repair Kit **Parts included in the Seal Kit

Represented Kelly Valves are rated at 10,000 psi WP. Valves are also available in 5,000 and 15,000 psi WP. Only the most popular sizes are shown above. Please contact Packard International for additional sizes.

KV-2 Two-piece Kelly Valves

Applications

Like the Packard International one-piece KV-1, the two-piece KV-2 provides a positive seal in the event of a kick. The KV-2 can be used as an upper kelly valve, lower kelly valve, safety valve, or mud saver.

Features and Benefits

Easy Maintenance

The KV-2 two-piece kelly valve offers similar functionality to the KV-1 with the added convenience of a two-piece construction for even easier maintenance. Its full bore also allows the unrestricted flow of drilling fluid — reducing wear on critical parts while providing unrestricted access for downhole tools.

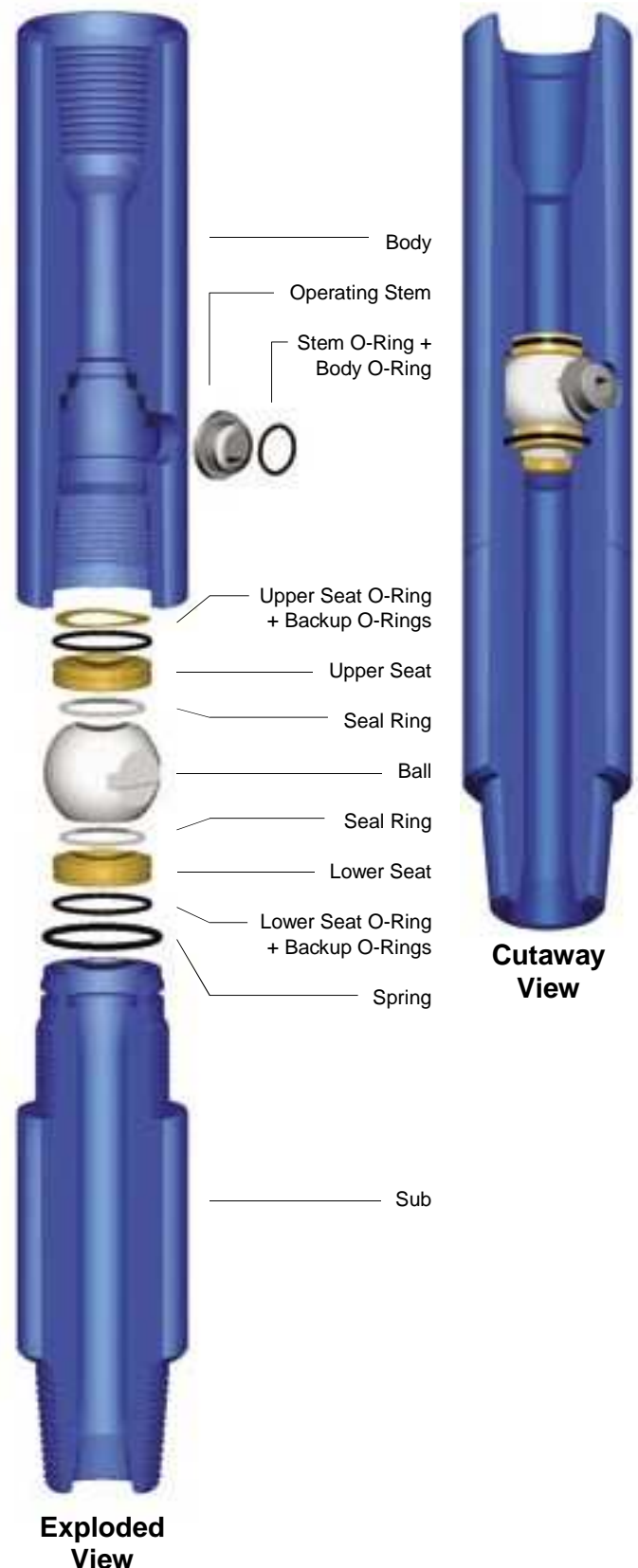
Connection Flexibility

The KV-2 can be provided with left-hand connections compatible with the swivel and upper kelly connections, as well as connections compatible with the lower kelly connections and any mating tool joints. Special threads are available upon request.

Packard International's KV-2 is built with enough length on each end to allow fully recutting the connections in the event of damage to the threads or shoulders where sealing takes place.

High and Low Pressure Sealing

High and low pressure sealing is assured by the Teflon and metal sealing system of the ball and seats of the KV-2. The ball and lower seat float while the upper seat is fixed in the body. This floating/fixed design aids in low pressure sealing and enables the operator to pressure balance the valve under full rated working pressure. The KV-2 is available up to 15,000 psi working pressures (22,500 psi hydrostatic test pressure).



Maintenance

Packard International's KV-2 is designed for even the harshest drilling conditions; however, it is suggested that parts most subject to wear and tear be replaced regularly.

Repair kits which include a ball stem, seats and O-ring seals should be replaced twice a year, with additional seals replaced midway between the repair kits.

For complete maintenance instructions and valve specifications, please phone 281-399-8771 or e-mail support@packardint.com.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the requested OD, ID, connections, and pressure rating or (2) the part number.

KV-2 Two-piece Kelly Valve Specifications					
Complete Valve		210-500200-17	210-514276-18	210-634234-19	210-734314-13
Size, Connection, & Weight		5" OD 3-1/2" IF (123 lb)	5-1/4" OD 4" IF or 4-1/2" XH (134 lb)	6-3/4" OD 4-1/2" IF (225 lb)	7-3/4" OD 5-1/2" FH (299 lb)
Valve Components	Quantity	2" ID	2-7/16" ID	2-3/4" ID	3-1/4" ID
Body	1	210-500200-17B (57 lb)	210-514276-18B (60 lb)	210-634234-19B (110 lb)	210-734314-13B (149 lb)
Seat O-Ring: 568-231 BUNA 70*/**	2	70-568-231	70-568-234	70-568-240	70-568-245
Seat*	2	100017 (2 lb)	200018 (2 lb)	100012 (2 lb)	100004 (2 lb)
Seal Ring: PTFE- 568-228*/**	2	PTFE-568-228	70-568-145	70-568-234	70-568-238
Ball*	1	100016 (4 lb)	200015 (4 lb)	100011 (6 lb)	100003 (9 lb)
Operating Stem*	1	100018 (.2 lb)	100007 (.5 lb)	100008 (1 lb)	100005 (1 lb)
Stem O-Ring: 568-218 BUNA 70*/**	1	70-568-218	70-568-218	70-568-229	70-568-229
Body O-Ring: 568-339 BUNA 70*/**	1	70-568-339	70-568-342	70-568-347	70-568-430
Spring*	1	SSR-0275-S17	SSR-0325-S17	A3917-042	A-4627-047
Sub	1	210-500200-17S (51 lb)	210-514276-18S (61 lb)	210-634234-19S (99 lb)	210-734314-13S (130 lb)
Operating Wrench	1	KVW-412-L	KVW-412-S	KVW-412-L	KVW-412-L
Seal Kit		210-200-SK	210-276-SK	210-234-SK	210-314-SK
Repair Kit		210-200-RK (9 lb)	210-276-RK (10 lb)	210-234-RK (12 lb)	210-314-RK (15 lb)

*Parts included in the Repair Kit **Parts included in the Seal Kit

Represented Kelly Valves are rated at 10,000 psi WP. Valves are also available in 5,000 and 15,000 psi WP. Only the most popular sizes are shown above. Please contact Packard International for additional sizes.

Safety Valves

Applications

Packard safety valves are designed to either stab into the drill pipe or tubing at the rig floor or are used as part of the drill string to shut off a well kick. Use of these valves in the drill string enhances rig safety.

Features and Benefits

Easy Maintenance

The Packard two-piece safety valve offers the convenience of a two-piece body for easy maintenance. Its full bore also allows the unrestricted flow of drilling fluid — reducing wear on critical parts while providing unrestricted access for downhole tools.

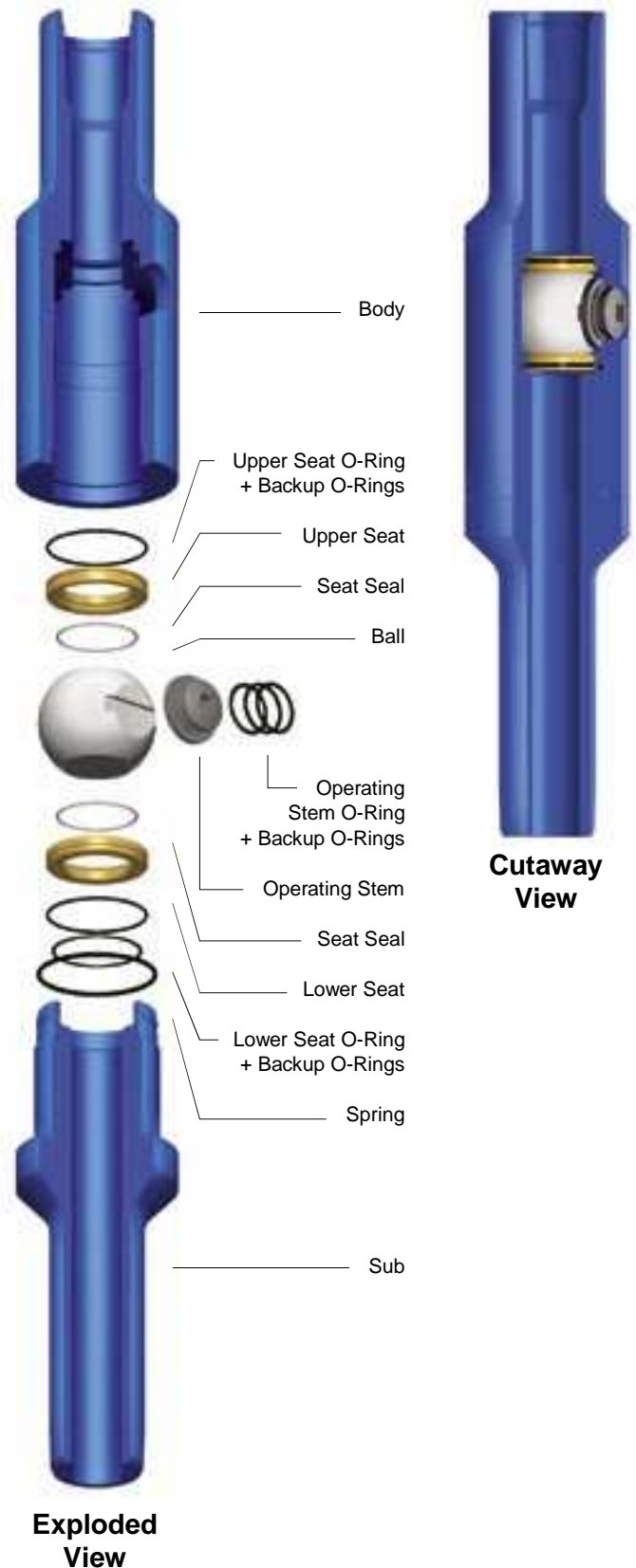
Connection Flexibility

Safety valves can be provided with tubing connections. Special threads are available upon request.

Packard International's safety valves are built with enough length on each end to allow fully recutting the connections in the event of damage to the threads or shoulders where sealing takes place.

High and Low Pressure Sealing

High and low pressure sealing is assured by the Teflon and metal sealing system of the ball and seats. The ball and lower seat float while the upper seat is fixed in the body. This floating/fixed design aids in low pressure sealing and enables the operator to pressure balance the valve under full rated working pressure.



Maintenance

Packard International's safety valves are designed for even the harshest drilling conditions; however, it is suggested that parts most subject to wear and tear be replaced regularly.

Repair kits which include a ball, stem, seats and O-ring seals should be replaced twice a year, with additional seals replaced midway between the repair kits.

For complete maintenance instructions and valve specifications, please phone 281-399-8771 or e-mail support@packardint.com.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the requested OD, ID, connections, and pressure rating or (2) the part number.

Safety Valve Specifications					
Complete Valve		310-412200-25	310-478276-27	310-638234-28	310-738314-30
Size, Connection, & Weight		4-1/2" OD 2" EUE (55 lb)	4-7/8" OD 2-7/8" EUE (93 lb)	6-3/8" OD 3-1/2" EUE (138 lb)	7-3/8" OD 4-1/2" EUE (186 lb)
Valve Components	Quantity	2" ID	2-7/16" ID	2-3/4" ID	3-1/4" ID
Body	1	310-412200-25B (23 lb)	310-478276-27B (36 lb)	310-638234-28B (69 lb)	310-738314-30B (88 lb)
Sub	1	310-412200-25S (22 lb)	310-478276-27S (41 lb)	310-638234-28S (50 lb)	310-738314-30S (76 lb)
Ball*	1	100016 (4 lb)	200015 (4 lb)	100011 (6 lb)	100003 (9 lb)
Seat*	2	100017 (2 lb)	200018 (2 lb)	100012 (2 lb)	100004 (2 lb)
Seal Ring: PTFE- 568-228*/**	2	PTFE-568-228	70-568-145	70-568-234	70-568-238
Operating Stem*	1	100018 (.2 lb)	100007 (.5 lb)	100008 (1 lb)	100005 (1 lb)
Stem O Ring: 568-218 BUNA 70*/**	1	70-568-218	70-568-218	70-568-229	70-568-229
Spring*	1	SSR-0275-S17	SSR-0325-S17	A3917-042	A-4627-047
Body O Ring: 568-339 BUNA 70*/**	1	70-568-339	70-568-342	70-568-347	70-568-430
Seat O Ring: 568-231 BUNA 70*/**	2	70-568-231	70-568-234	70-568-240	70-568-245
Operating Wrench	1	KVW-412-L	KVW-412-S	KVW-412-L	KVW-412-L
Seal Kit		210-200-SK	210-276-SK	210-234-SK	210-314-SK
Repair Kit		210-200-RK (9 lb)	210-276-RK (10 lb)	210-234-RK (12 lb)	210-314-RK (15 lb)

*Parts included in the Repair Kit **Parts included in the Seal Kit

Represented Safety Valves are rated at 10,000 psi WP. Valves are also available in 5,000 psi WP. Only the most popular sizes are shown above. Please contact Packard International for additional sizes.

Drop-in Check Valves

Applications

Packard's Drop-in Check Valve (DICV) is used to provide protection from backflow during periods when the drill string is left open or kicks are frequent. The landing sub is installed just above the bit sub. The valve may either be installed with the landing sub or placed in the drill string at the top and pumped down to the landing sub. Once seated it allows downward mud-flow only.

Features and Benefits

Easy Maintenance

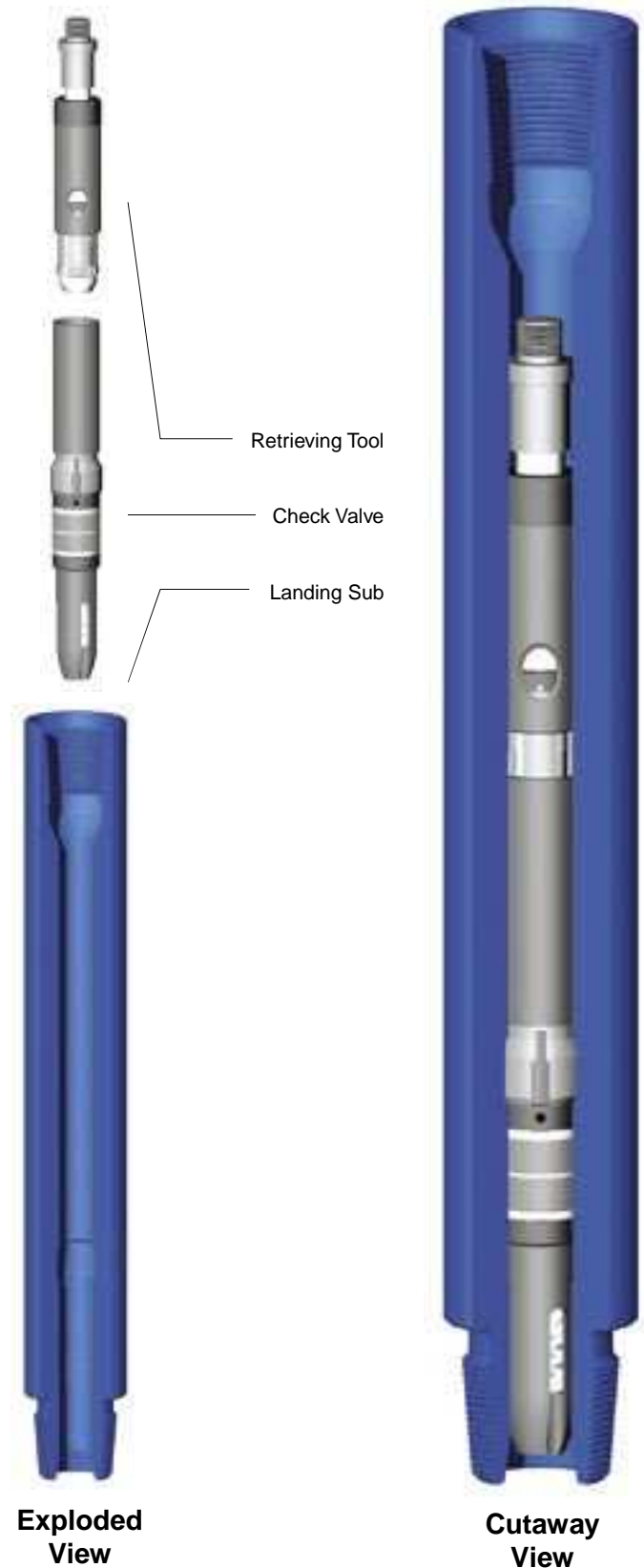
The Packard International DICV is manufactured and tested in accordance with API Specification 7-1 with NACE compliant internal components. The retrieval tool is attached to a wireline and locks into place when it is lowered to the valve.

Connection Flexibility

The Packard International DICV can be supplied with any API connection, including many proprietary threads supplied by licensed vendors and OEMs.

High and Low Pressure Sealing

High and low pressure sealing is assured by the unique elastomer and metal-to-metal sealing systems. The DICV is available in pressure ratings up to 15,000 psi working pressure (22,500 psi test pressure).



Drop-in Check Valve Specifications

Complete Assembly	710-035434-17	710-043658-19	710-048734-14
Size, Connection, & Weight	4-3/4" OD 3-1/2" IF (145 lb)	6-5/8" OD 4-1/2" IF (286 lb)	7-3/4" OD 5-1/2" FH (398 lb)

Drop-in Check Valve Components

Landing Sub	710-035434-17LS	710-043658-19LS	710-048734-14LS
Size and weight	2-1/8" ID (124 lb)	2-5/8" ID (250 lb)	2-15/16" ID (347 lb)
Check Valve	710-035-CV	710-043-CV	710-048-CV
Size	2-3/16" OD	2-3/4" OD	3" OD
Retrieval Cylinder	710-035-RC (1.5 lb)	710-043-RC (2.4 lb)	710-048-RC (3.1 lb)
Running Neck	710-035-RN (1.0 lb)	710-043-RN (1.4 lb)	710-048-RN (3.4 lb)
Dogs	710-035-D (1.1 lb)	710-043-D (1.5 lb)	710-048-D (1.9 lb)
Packing Mandrel	710-035-PM (2.0 lb)	710-043-PM (3.4 lb)	710-048-PM (5.3 lb)
V-Packings (8 per set)	710-035-VP (1.0 lb)	710-043-VP (1.8 lb)	710-048-VP (2.1 lb)
Packing Ring Set	710-035-PR (1.0 lb)	710-043-PR (2.0 lb)	710-048-PR (2.8 lb)
Seal Sub	710-035-SS (1.1 lb)	710-043-SS (1.7 lb)	710-048-SS (3.1 lb)
Ball	710-035-B (.8 lb)	710-043-B (1.2 lb)	710-048-B (2.4 lb)
Spring	710-035-S (.1 lb)	710-043-S (.1 lb)	710-048-S (.1 lb)
Cage	710-035-C (1.6 lb)	710-043-C (3.1 lb)	710-048-C (4.8 lb)
Retrieval Tool	710-035-RT	710-043-RT	710-048-RT
Fishing Neck	710-035-FN (1.1 lb)	710-043-FN (1.8 lb)	710-048-FN (2.1 lb)
Retrieval Pin	710-035-RP (3.8 lb)	710-043-RP (5.2 lb)	710-048-RP (6.5 lb)
Hex Set Screw	710-035-HS (.1 lb)	710-043-HS (.1 lb)	710-048-HS (.1 lb)
Top Sub	710-03-TS (1.7 lb)	710-03-TS (3.1 lb)	710-03-TS (5.5 lb)
Shear Pin	710-035-SP (.2 lb)	710-043-SP (.3 lb)	710-048-SP (.2 lb)
Retrieval Sleeve	710-035-RS (.9 lb)	710-043-RS (1.7 lb)	710-048-RS (1.9 lb)
Upper Spring	710-035-US (.3 lb)	710-043-US (.5 lb)	710-048-US (.8 lb)
Dog Sleeve	710-035-DS (.6 lb)	710-043-DS (1.2 lb)	710-048-DS (1.9 lb)
Lower Spring	710-035-LS (.2 lb)	710-043-LS (.3 lb)	710-048-LS (.4 lb)
Dog Ring	710-035-DR (.2 lb)	710-043-DR (.6 lb)	710-048-DR (2.1 lb)
Retrieval Dogs (4 per set)	710-035434-17 (.1 lb)	710-043434-17 (.3 lb)	710-048434-17 (1.0 lb)

Maintenance

The Packard International DICV is designed for the harshest drilling environments, however it is suggested the parts most subject to wear be replaced at regular intervals.

The repair kits include a ball, the spring, and the elastomer seals. Repair kits should be installed twice a year, with additional elastomer seals replaced midway between the repair kits.

For complete maintenance instructions and valve specifications, phone 281-399-8771 or e-mail support@packardint.com.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify all of the following:

- (1) the smallest drill string bore through which the check valve must pass
- (2) the landing sub connection size and type
- (3) the outside diameter of mating tool joints

Represented Drop-in Check Valves are rated at 10,000 psi WP. Valves are also available in 5,000 and 15,000 psi WP.

Only the most popular sizes are shown in the chart. Please contact Packard International for additional sizes.

Inside Blowout Preventers

Applications

Packard's Inside Blowout Preventer (IBOP) is used to provide shutoff of backflow during periods when the drill string is open. The valve is held with the dart in the open position to allow stabbing during backflow. After stabbing the flow is shut off by turning the release handle. The stab body is removed and the drill string can be reconnected to re-establish pressure stabilization. The valve can then be removed and returned to its ready state or it can be left in the drill string to ensure downward flow only.

Features and Benefits

Easy Maintenance

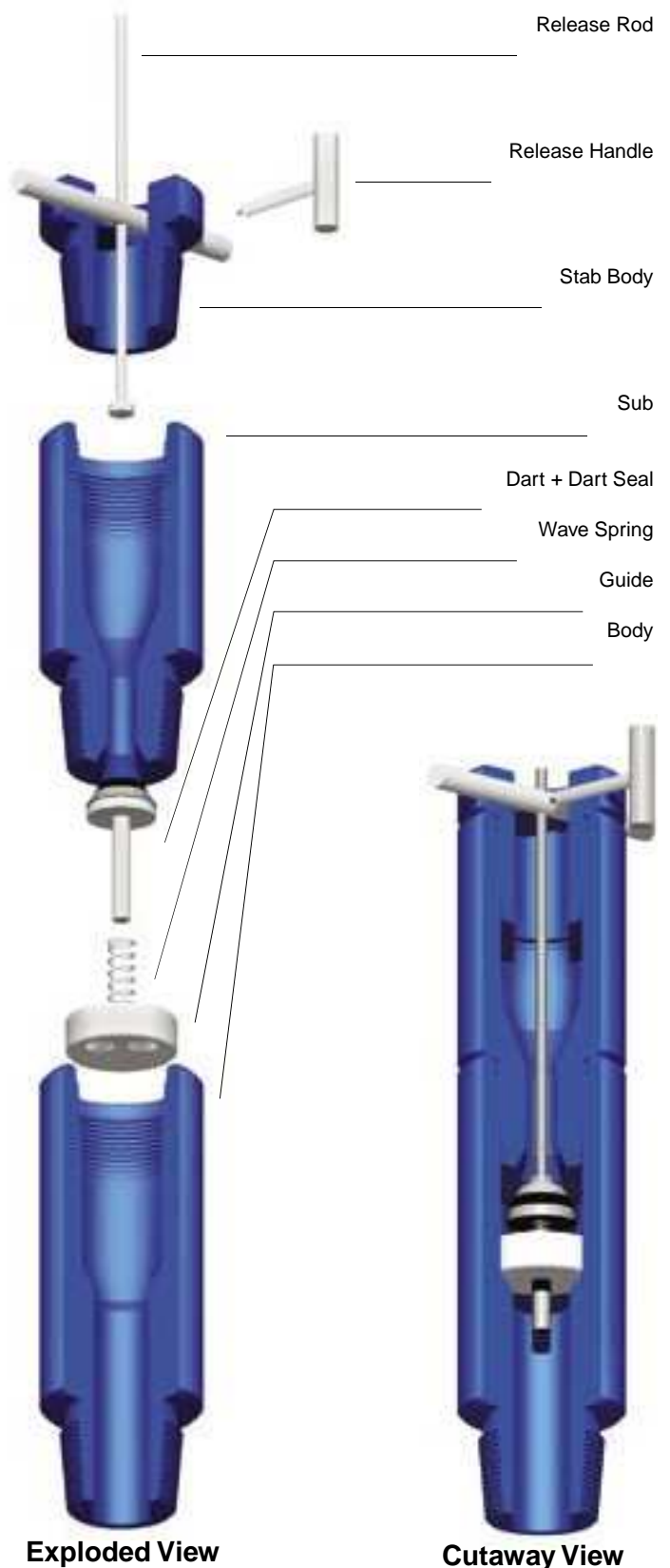
The Packard International IBOP is manufactured and tested in accordance with API Specification 7-1 with NACE compliant internal components. The integral seat design minimizes repair time and costs.

Connection Flexibility

The Packard International IBOP can be supplied with any API connection, including many proprietary threads supplied by licensed vendors and OEMs.

High and Low Pressure Sealing

High and low pressure sealing is assured by Packard's unique elastomer and metal-to-metal sealing systems. The IBOP is available in pressure ratings up to 15,000 psi working (22,500 psi test pressure).



Maintenance

The Packard International IBOP is designed for the harshest drilling environments, however it is suggested the parts most subject to wear be replaced at regular intervals.

The repair kits include the dart, the guide, the spring, and the elastmer seal. Repair kits should be installed twice a year, with additional elastomer seals replaced midway between the repair kits.

For complete maintenance instructions and valve specifications, phone 281-399-8771 or e-mail support@packardint.com.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the requested OD, ID, connections, and pressure rating or (2) the part number.

Packard International Inside Blow Out Preventer					
Complete Valve		405-334-15	410-500-17	410-658-19	415-800-14
Size, Connection, Pressure Rating, & Weight		3-3/4" OD 2-3/8 IF 5,000 psi WP (89.80 lb)	5" OD 3-1/2 IF 10,000 psi WP (92 lb)	6-5/8" OD 4-1/2 IF 10,000 psi WP (194 lb)	8" OD 6-5/8 FH 15,000 psi WP (324 lb)
Valve Components	Quantity				
Body	1	405-334-15B (41 lb)	410-500-17B (41 lb)	410-658-19B (88 lb)	410-800-14B (146 lb)
Sub	1	405-334-15S (25.5 lb)	410-500-17S (25 lb)	410-658-19S (57 lb)	410-800-14S (106 lb)
Stab Body	1	405-334-15SB (12 lb)	410-500-17SB (13 lb)	410-658-19SB (30 lb)	410-800-14SB (57 lb)
Dart*	1	400033 (1.3 lb)	400039 (1.5 lb)	400044 (3 lb)	400044 (3 lb)
Spring*	1	40104 (0.1 lb)	40104 (0.1 lb)	40104 (0.1 lb)	40104 (0.1 lb)
Guide*	1	400034 (3.1 lb)	400040 (4.4 lb)	400045 (5 lb)	410-458-G (5 lb)
Seal*	1	2003	2003	2009	2009
Release Handle	1	400028 (2.5 lb)	400028 (2.5 lb)	400028 (2.5 lb)	400028 (2.5 lb)
Release Rod	1	400029 (0.8 lb)	400029 (0.8 lb)	400029 (0.8 lb)	400029 (0.8 lb)
Stab Handle	1	400026 (3.5 lb)	400026 (3.5 lb)	400026 (3.5 lb)	400026 (3.5 lb)
Repair Kit		410-296-RK	410-318-RK	410-418-RK	410-458-RK

*Parts included in the Repair Kit

Only the most popular sizes are shown above. Please contact Packard International for additional sizes.

Cup Testers

Applications

Packard International's F-type cup tester assemblies are designed to be attached to the drill string and lowered into the casing beneath the wellhead to pressure test the blowout preventer stack and the wellhead.

Features and Benefits

Sizes, Pressure Ratings, and Connections for Every Job

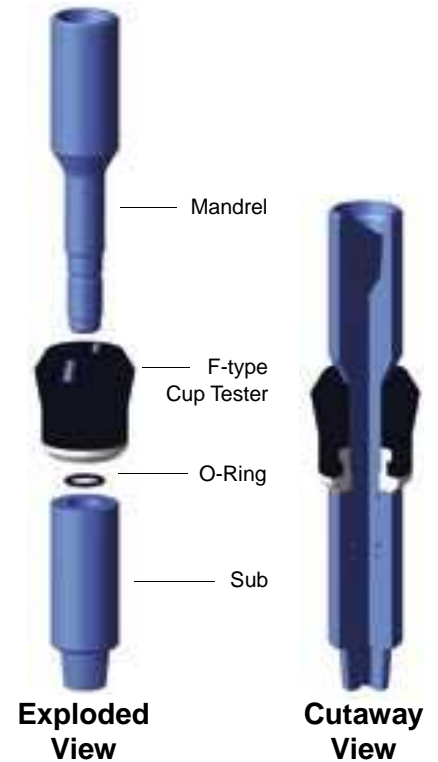
The cup tester assemblies are rated to the API standard mill test pressure for the casing sizes up to 10,000 psi. Special reinforcing can be offered on all cup sizes and casing weight ranges to hold up to 15,000 psi.

Packard International cup tester assemblies are provided with internal flush connections. Other connections are available at an additional cost.

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the casing size and weight per foot or (2) the part number or (3) the OD, ID, and drift diameter.



Cup Testers Specifications							
Assembly Number	Mandrel		Cup Part Number	Casing Size (in.)	Casing Weight Range (lb/ft)	Total Load Capacity (lb)	Cup Pressure Area (in. ²)
		Mandrel Part No.					
P30594-01	2-3/8 IF	P30589/ P30590	P30591A	4-1/2	9.50-15.10	270,000	9.5
P30594-02	2-3/8 IF	P30589/ P30590	P30592	5	11.50-18.00	270,000	11.7
P30594-03	2-3/8 IF	P30589/ P30590	P30593	5-1/2	14.00-23.00	270,000	16.1
P30594-05	2-7/8 EUE	P30589M/ P30590M	P30593	5-1/2	15.00-23.00	270,000	16.1
P30605-01	3-1/2 IF	P30595/ P30596	P30597	6-5/8	20.00-32.00	500,000	19.8
P30605-08	3-1/2 IF	P30595/ P30596	P30597A	6-5/8	35.00	500,000	19.8
P30605-07	3-1/2 IF	P30595/ P30596	P30599-03	7	41.00	500,000	19.8
P30605-02	3-1/2 IF	P30595/ P30596	P30598-02	7	17.00-26.00	500,000	23.9
P30605-03	3-1/2 IF	P30595/ P30596	P30598-01	7	29.00-38.00	500,000	20.4
P30605-04	3-1/2 IF	P30595/ P30596	P30599-01	7-5/8	24.00-26.40	500,000	29
P30605-05	3-1/2 IF	P30595/ P30596	P30599-02	7-5/8	29.70-39.00	500,000	27.3
P30600-04	4-1/2 IF	P30603/ P30604	P30606-01	8-5/8	40.00-49.00	800,000	29
P30600-11	4-1/2 IF	P30603/ P30604	P30606-02	8-5/8	24.00-36.00	800,000	29
P30600-01	4-1/2 IF	P30603/ P30604	P30601-01	9-5/8	32.30-40.00	800,000	45.5
P30600-02	4-1/2 IF	P30603/ P30604	P30601-02	9-5/8	43.50-53.50	800,000	42.3
P30600-05	4-1/2 IF	P30603/ P30604	P30607-01	10-3/4	32.75-51.00	800,000	63.5
P30600-06	4-1/2 IF	P30603/ P30604	P30607-02	10-3/4	55.50-65.70	800,000	56.8
P30600-03	4-1/2 IF	P30603/ P30604	P30578	12-3/4	49.6	800,000	113.1
P30600-07	4-1/2 IF	P30603/ P30604	P30579-02	13-3/8	48.00-61.00	800,000	108.7
P30600-08	4-1/2 IF	P30603/ P30604	P30579-01	13-3/8	68.00-72.00	800,000	102.8
P30600-09	4-1/2 IF	P30603/ P30604	P30584	16	65.00-84.00	800,000	167.2
P30600-16	4-1/2 IF	P30603/ P30604	P30584A	16-3/4	69	800,000	182.4
P30600-12	4-1/2 IF	P30603/ P30604	P674819	18-5/8	87.5	800,000	229.1
P30600-10	4-1/2 IF	P30603/ P30604	P33543	20	94-133.00	800,000	268.9

Only the most popular sizes are shown above. Please contact Packard International for additional sizes.

Drill Stem Subs

Applications

Packard International rotary subs are designed and manufactured according to their application. These applications include (but are not limited to) connection crossover subs, saver subs, side entry subs, pump-in subs, circulating subs, lifting subs, impression blocks, reduced section subs, bit subs, swivel subs, etc.

Features and Benefits

Fully Customizable and Certified

The Packard International subs are designed and produced to exacting standards. Customers may specify sizes, heat treatments, material grades, chrome/phosphate/paint coatings, cold working of threads, non-destructive testing, or any other required specification. Material and/or services are fully traceable with certifications made available to all customers for nominal fees upon request.

Connection Flexibility

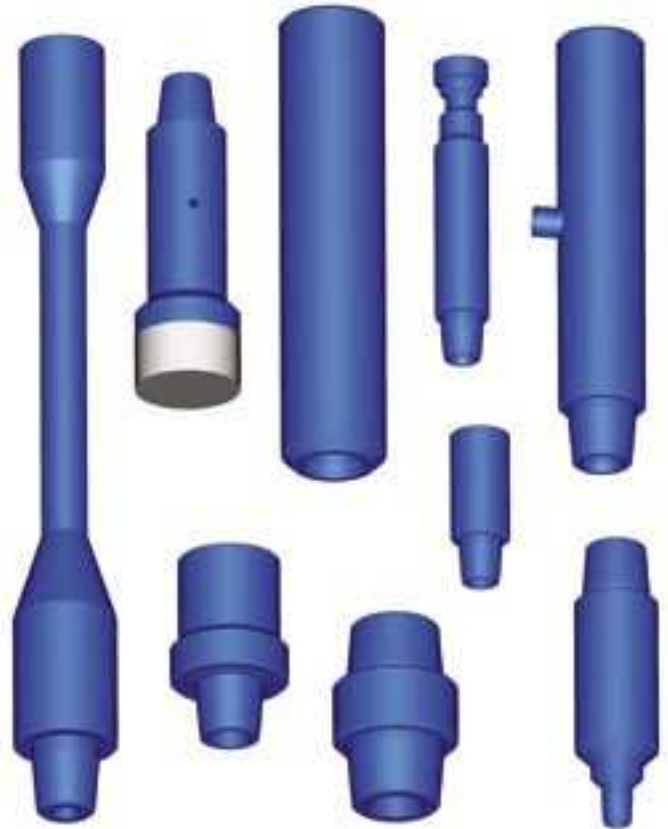
The Packard International subs can be supplied with any API connection, including many proprietary threads supplied by licensed vendors and OEMs.

Drill Stem Subs for Every Need

Some of the drill stem subs that we provide are:

- Bit Subs – Connect the bit to the drill string
- Swivel Subs – Double-pin subs that connect the swivel to the kelly valve
- Kelly Saver Subs – Save threads on the Kelly valve
- Crossover Subs – Allow change from one thread type to another
- Pump-In Subs – Allow heavier/lighter mud to be circulated into the drill string
- Lift Subs – Allow lifting out the drill string
- Drill Collar Subs – Allow connection between drill pipe and drill collar
- Impression Blocks – Used for downhole fishing

For subs that are not listed, please contact our sales representatives.



How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering, please specify the OD, ID, connections, overall or shoulder-to-shoulder length, and any specific requirements.

The Kelly Valve Line Acquired from OMSCO

About the OMSCO Kelly Valve Line Acquisition

In April of 2004, Packard International purchased all assets of OMSCO's kelly valve product line, a mainstay of the oil and gas industry since 1945.

A change in corporate focus within OMSCO lead them to search for another company to continue the production of their world-renowned kelly valve product line.

“The kelly valve line has been one of our bread and butter lines for decades. While we wanted to divest this product line, we knew we had to have the right company to handle it, and that’s definitely Packard.”

— Les Hutchison
Vice President and General Manager, OMSCO

The OMSCO designed line of kelly valve products enables Packard International to provide a broader array of products for its customers in the international oil and gas drilling market.

Manufacturer of its own respected line of kelly valve products since 1983, Packard International is proud to add OMSCO's kelly valve product line to its array of other quality products.



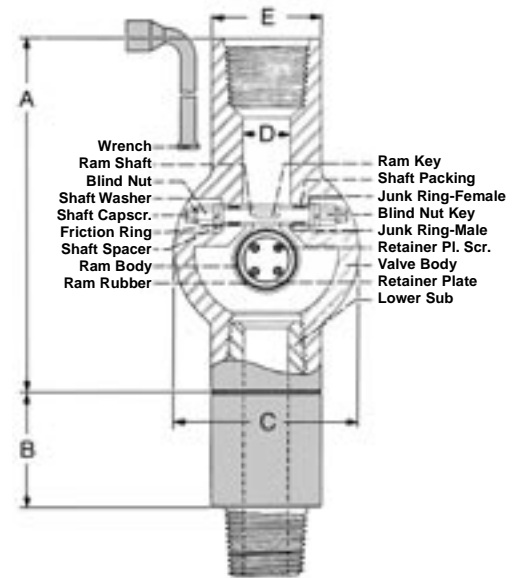
OMSCO's patented kelly valve designs have become legendary throughout the international oil and gas industry.

Flapper Design Upper Kelly Valve*

*Packard International is now the sole manufacturer of this product design acquired from OMSCO.

This flapper-type valve design has remained virtually unchanged and unchallenged over the years due to its simplicity of operation and field-servicing ease.

Below the valve body a special threaded sub offers long wear and easy replacement should lower threads become damaged, and, when removed allows easy access to the valve cavity for repair. The valve must be manually closed. It can be partially opened by starting up the mud pumps, but must be fully opened manually to prevent mud cutting.



Features and Benefits

- Proven flapper-type design for simple operation and easy servicing
- Monel steel ram shafts to prevent corrosion and sticking. Sealed lubrication packing. Complete stainless steel valve parts available for H₂S service.
- Available in 5,000; 10,000; and 15,000 psi working pressure
- Complete with operating wrench and thread protectors

Flapper Design Upper Kelly Valve Specifications

Complete Valve	KV800000		KV900000		KV100000
Part Name	6-5/8 - 5,000 psi WP		6-5/8 - 10,000 psi WP		6-5/8 - 15,000 psi WP
Valve Body	305 lb	1 Part No. KV601S00	415 lb	1 Part No. KV701S00	1 Part No. KV701SR0
Ram Shaft	2.13 lb	1 Part No. KV604SA0	2.13 lb	1 Part No. KV604SA0	1 Part No. KV604SA0
Junk Ring-Female	12 lb	2 Part No. KV610S00	12 lb	2 Part No. KV610S00	2 Part No. KV610S00
Shaft packing Set	.05 lb	2 Part No. KV210000	.05 lb	2 Part No. KV210000	2 Part No. KV210000
Junk Ring-Male	.29 lb	2 Part No. KV612S00	.29 lb	2 Part No. KV612S00	2 Part No. KV612S00
Ram Body	3.30 lb	1 Part No. KV613S00	3.30 lb	1 Part No. KV613S00	1 Part No. KV613SR0
Ram Key	.06 lb	1 Part No. KV614S00	.06 lb	1 Part No. KV614S00	1 Part No. KV614S00
Ram Rubber	.55 lb	1 Part No. KV616S00	.55 lb	1 Part No. KV616S00	1 Part No. KV616SR0
Retainer Plate	2.25 lb	1 Part No. KV617S00	2.25 lb	1 Part No. KV617S00	1 Part No. KV617SR0
Retainer Plate Screw	.08 lb	4 Part No. KV618S00	.08 lb	4 Part No. KV618S00	4 Part No. KV618SR0
Wrench	6.0 lb	1 Part No. KV622S00	6.0 lb	1 Part No. KV622S00	1 Part No. KV622S00
Shaft Spacer	.16 lb	2 Part No. KV626S00	.16 lb	2 Part No. KV626S00	2 Part No. KV626S00
Friction Ring	.08 lb	2 Part No. KV627S00	.08 lb	2 Part No. KV627S00	2 Part No. KV627S00
Blind Nut Set	.38 lb	2 Part No. KV633SAS	.38 lb	2 Part No. KV633SAS	2 Part No. KV633SAS
Shaft Cap Screw	.11 lb	2 Part No. KV634S00	.11 lb	2 Part No. KV634S00	2 Part No. KV634S00
Shaft Washer	.09 lb	2 Part No. KV4SP600	.09 lb	2 Part No. KV4SP600	2 Part No. KV4SP600
Blind Nut Key	.02 lb	2 Part No. KV635S00	.02 lb	2 Part No. KV635S00	2 Part No. KV635S00
Lower Sub	168 lb	1 Part No. KV632S00	193 lb	1 Part No. KV632SA0	1 Part No. KV632SA0
Complete Valve Kit	13 lb	1 Part No. KV636S00	13 lb	1 Part No. KV636SP0	1 Part No. KV636SP0
Dimension A (in.)	26		27		27
Dimension B (in.)	8-1/2		11		11
Dimension C (in.)	13-1/2		14-1/2		14-1/2
Dimension D (in.)	3		3		3
Dimension E (in.)	8		9		9
Total Weight	515 lb		720 lb		650 lb

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the working pressure and (2) standard or stainless steel parts.

Lower Kelly Valves*

*Packard International is now the sole manufacturer of this product design acquired from OMSCO.

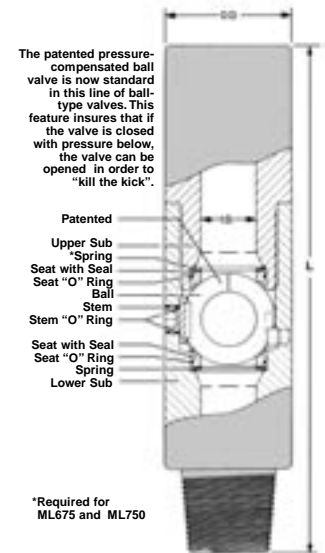
The lower kelly valve body is manufactured from 4145H modified fully heat treated alloy steel. This valve is a two piece design and is a positive opening, ball type valve. When installing the valve in the drill string, the same amount of torque should be applied in the make up of the valve as is used in making up tool joints.

By closing this valve before breaking a joint, you will save mud and keep the drilling floor cleaner and free of excess mud. The heavy duty body design enables the contractor to use this valve above and/or below the kelly.

The lower kelly valve comes complete with a hex-type operating wrench and pressed steel thread protectors.

Features and Benefits

- Self-lubricating, ball-type valve
- Stainless steel ball and non-corrosive seat are standard
- Two piece design with fewer replacement parts for easy, economical repair



Lower Kelly Valve Specifications						
Complete Valve	LK525000	LK600000	LK637000	LK650000	ML675000	ML750000
Size & Working Pressure	5-1/4" - 10,000 psi WP	6" - 15,000 psi WP	6-3/8" - 10,000 psi WP	6-1/2" - 15,000 psi WP	6-3/4" - 10,000 psi WP	7-1/2" - 15,000 psi WP
Approx. Weight (lb)	136	196	180	195	220	310
OD (in.)	5-1/4	6	6-3/8	6-1/2	6-3/4	7-1/2
ID (in.)	2	2	2-3/4	2-9/16	3	3
Length (in.)	30	30	32	32	32	36
Wrench-Hex	1 Part No. LK841001	1 Part No. LK841001	1 Part No. LK841001	1 Part No. LK841001	1 Part No. LK841001	1 Part No. LK841001
Upper Sub	1 Part No. LK812001	1 Part No. LK822001	1 Part No. LK832001	1 Part No. LK832H01	1 Part No. LK842001	1 Part No. LK862001
Spring	1 Part No. LK813000	1 Part No. LK813000	1 Part No. LK833000	1 Part No. LK833000	2 Part No. LK843000	2 Part No. LK843000
Seat with Seal	2 Part No. LK814000	2 Part No. LK814000	2 Part No. LK834000	2 Part No. LK834H00	2 Part No. LK844000	2 Part No. LK844000
Teflon "O" Ring	2 Part No. LK521000	2 Part No. LK521000	2 Part No. LK621000	2 Part No. LK621000	2 Part No. LK821000	2 Part No. LK821000
Seat "O" Ring	2 Part No. LK815000	2 Part No. LK815000	2 Part No. LK835000	2 Part No. LK835000	2 Part No. LK845000	2 Part No. LK845000
Ball	1 Part No. LK816000	1 Part No. LK816000	1 Part No. LK836000	1 Part No. LK836000	1 Part No. LK846000	1 Part No. LK846000
Stem	1 Part No. LK81700P	1 Part No. LK83700P	1 Part No. LK83700P	1 Part No. LK83700P	1 Part No. ML84700P	1 Part No. ML86700P
Stem "O" Ring Set	1 Part No. LK818000	1 Part No. LK818000	1 Part No. LK818000	1 Part No. LK818000	1 Part No. LK818000	1 Part No. LK818000
Complete Valve Kit	1 Part No. LK830000	1 Part No. LK830H00	1 Part No. LK890000	1 Part No. LK890H00	1 Part No. ML850000	1 Part No. LM850H00
Lower Sub	1 Part No. LK810001	1 Part No. LK820001	1 Part No. LK880001	1 Part No. LK880H01	1 Part No. LK840001	1 Part No. LK860001
Sub "O" Ring	N/A	N/A	N/A	N/A	N/A	1 Part No. LK863000

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773. When ordering please specify: (1) the size and (2) the working pressure.

Please specify serial number when ordering repair parts.

One-piece Kelly Valves*

*Packard International is now the sole manufacturer of this product design acquired from OMSCO.

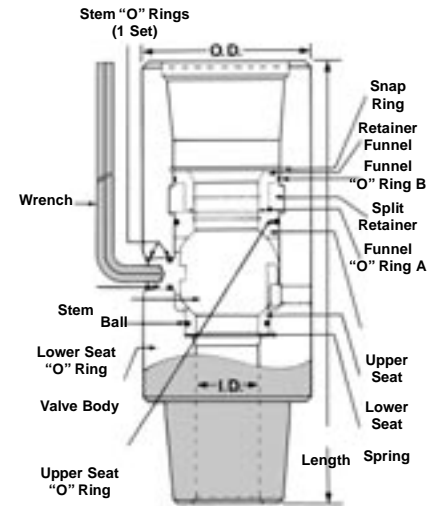
This single-piece kelly valve series is another variance to the standard valve where length or working space is a problem. When this valve is removed from the string, the internal parts are accessible for easy field repair.

The smooth outside diameter permits this valve to be run anywhere in the string. A tool kit with instructions is available for assembly and disassembly.

This compact valve, with a maximum overall length of 24", is an excellent choice when special space requirements exist.

Features and Benefits

- Compact size
- Ready access to internal parts for easy field repair
- Adaptable for use anywhere in the string
- Complete with operating wrench and thread protectors



One-piece Upper Valve Specifications	
Complete Valve	KVSP80
Test Pressure	22,500 psi
Working Pressure	15,000 psi
OD (in.)	8
ID (in.)	3
Length (in.)	24
Approximate Weight (lb)	232
Valve Body	KV-680M
Stem	KV68100P
Stem "O" Ring (Set)	LK818A&B
Spring	LK843000
Seat (Lower)	LK844000
Seat Teflon "O" Ring	LK821000
Lower Seat "O" Ring	LK845000
Ball	LK846000
Seat (Upper)	KV687000
Upper Seat "O" Ring	KV688
Upper Seat Retainer (4 Piece)	KV689M
Retaining Funnel	KV691VM
Snap Ring	KV695V00
Wrench	LK841000
Retaining Funnel "O" Ring "A"	KV693V
Retaining Funnel "O" Ring "B"	KV694V
Complete Valve Kit	KV686000
Assembly & Disassembly Tool Kit	SPTK2

One-piece Lower Valve Specifications			
Complete Valve	LKSP5001	LKSP6300	LKSP65M0
Test Pressure	15,000 psi	15,000 psi	22,500 psi
Working Pressure	10,000 psi	10,000 psi	15,000 psi
OD (in.)	5	6-3/8	6-1/2
ID (in.)	1-3/4	2-3/4	2-9/16
Length (in.)	17	24	24
Approximate Weight (lb)	63	145	150
Wrench-Hex	LK841002	LK841000	LK841000
Valve Body	LK552001	LK852M00	LK852HM0
Stem (1)	LK81700P	LK83700P	LK83700P
Stem "O" Ring (set) (1)	LK818A&B	LK818A&B	LK818A&B
Spring (1)	LK533000	LK833000	LK833000
Seat (Lower) (1)	LK534000	LK834000	LK834H00
Lower Seat "O" Ring (1)	LK535000	LK835000	LK835000
Seat Teflon "O" Ring (2)	LK421000	LK621000	LK621000
Ball (1)	LK536000	LK836000	LK836H00
Seat (Upper) (1)	LK554000	LK854000	LK854H00
Upper Seat "O" Ring	LK555000	LK855000	LK855000
Upper Seat Retainer (1)	LK556000	LK856M00	LK856M00
Retaining Funnel (1)	LK557000	LK857M00	LK857MH0
Snap Ring (1)	LK561000	LK895000	LK895000
Retaining Funnel "O" Ring "A"	LK560000	LK889000	LK889000
Retaining Funnel "O" Ring "B"	LK555000	LK855000	LK855000
Complete Valve Kit (1)	LK559000	LK859000	LK859H00
Assembly & Disassembly Tool Kit (1)	SPTK4	SPTK1	SPTK3
Available Connections	3-1/2" IF	4-1/2" XH or 4-1/2" IF	

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) Upper or Lower and (2) the size and working pressure.

Reverse Flow Check Valves*

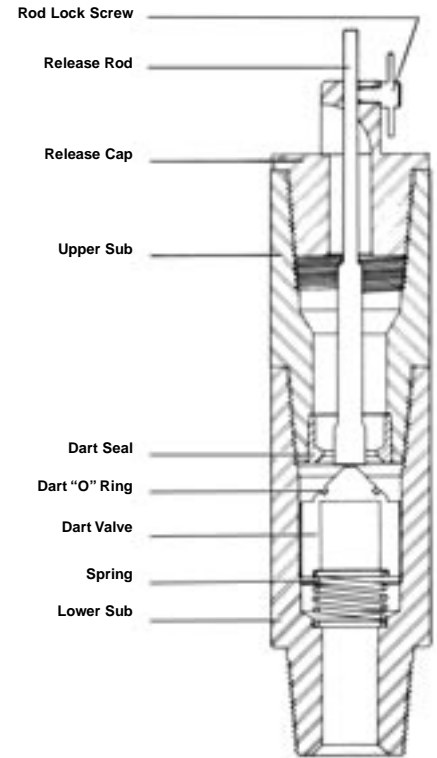
*Packard International is now the sole manufacturer of this product design acquired from OMSCO.

Reverse flow check valves are the most reliable, first line of defense in protecting your swivel, standpipe, pumps and crew from the dangers of drill string kicks. It is specifically designed to be run through most BOP stacks as an integral part of the string when drilling through transitional zones or anytime a kick might be anticipated.

The unique top vent on the valve permits a partial flow-by of drilling fluids to make emergency stabbing faster and safer. The body of the valve is made from AISI 4145H modified fully heat treated steel alloy with a dart and seat specially designed to minimize the effects of mud cutting and washouts.

Features and Benefits

- Specifically designed to be run through most BOP stacks as an integral part of the string
- Unique top vent permits partial flow-by of drilling fluids for faster and safer emergency stabbing
- Dart and seat specially designed to minimize effects of mud cutting and washout
- Can be run as deep as necessary in controlling a kick
- Safety both on the rig floor and down hole
- Can be supplied with parts suitable for H₂S service



Reverse Flow Check Valve Specifications

Complete Valve	IB475000	IB475500	IB525000	IB525500	IB625000	IB637500	IB650001	IB650000
Size & Working Pressure	3-1/2" IF 10,000 psi WP	3-1/2" IF 15,000 psi WP	4" FH 10,000 psi WP	4" FH 15,000 psi WP	4-1/2" XH 10,000 psi WP	4-1/2" IF 10,000 psi WP	4-1/2" XH 10,000 psi WP	4-1/2" IF 10,000 psi WP
Approx. Weight (lb) Complete with Release Assembly	93	93	115	115	151	169	178	178
OD (in.)	4-3/4	4-3/4	5-1/4	5-1/4	6-1/4	6-3/8	6-1/2	6-1/2
ID (in.)	2	2	2	2	2-1/4	2-1/4	2-1/4	2-1/4
Length (in.)	26-1/2	26-1/2	26-1/2	26-1/2	27-1/2	27-1/2	27-1/2	27-1/2
Rod Lock Screw (1)	IB403000	IB403000	IB403000	IB403000	IB403000	IB403000	IB403000	IB403000
Release Rod (1)	IB404000	IB404000	IB404000	IB404000	IB404000	IB404000	IB404000	IB404000
Release Cap (1)	IB305000	IB305000	IB306000	IB306000	IB405000	IB406000	IB405000	IB406000
Upper Sub (1)	IB307000	IB307000	IB308000	IB308000	IB407000	IB408000	IB417000	IB418000
Dart Seat (1)	IB309A00	IB309A00	IB309A00	IB309A00	IB419000	IB419000	IB419000	IB419000
Dart "O" Ring (1)	IB310000	IB310000	IB310000	IB310000	IB410000	IB410000	IB410000	IB410000
Dart Valve (1)	IB311001	IB311001	IB311001	IB311001	IB421001	IB421001	IB421001	IB421001
Spring (1)	IB312000	IB312A00	IB312000	IB312A00	IB412000	IB412000	IB412000	IB412000
Lower Sub (1)	IB313000	IB313000	IB314000	IB314000	IB413000	IB414000	IB423000	IB424000

How to Order

To place an order, please phone 281-399-8771, e-mail sales@packardint.com, or fax your order to 281-399-8773.

When ordering please specify: (1) the size and working pressure, (2) H₂S service, if required, and (3) the floor stabbing release requirement.

Quality Control and Testing

Dedicated to the Spirit of Continuous Improvement

Packard International is dedicated to excellence in service and product quality. As a manufacturer and supplier supporting the drilling industry, we strive to conform to industry standards and meet customer requirements and expectations.

Our quality program is focused on providing products and services that conform to customers' requirements and create a high level of satisfaction and confidence with the application of our products. Packard is dedicated to the spirit of continuous improvement to meet the increasing demands of our industry.

Packard International's quality program is certified in accordance with the latest edition of API Q1, API Specification 7-1 (API license #7-1-0207) and ISO 9001: 2008 (ISO 9001#163). Quality policies, quality assurance guidelines and quality control practices are documented in accordance with program requirements. Product design has been refined over years of practical field use.

Our manufacturing organization is staffed with experienced supervision and senior manufacturing professionals with many years of precision machining experience. Material specifications include modern quality practices from material suppliers and steel components heat treated to specific mechanical properties. Material quality is supported with the appropriate documentation, ensuring customers benefit from contemporary quality improvements in the industry.

Our manufacturing quality practices include detailed dimensional and functional checks that include pressure testing valve bodies and seals in accordance with API requirements. All components and assemblies are fully traceable.

Finally, the importance of the quality program is emphasized through the integration of the company's goals, staff, strategy, structure and supporting systems to provide confidence that Packard International's products and services will meet customer expectations.



Packard
INTERNATIONAL

*Innovations in Drill Stem
Safety Valve Technology*

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