Red Deer Ironworks

Low Torque Plug Valve Maintenance Manual

Parts Covered: PV21502LT, PV21502LTSTD, PV31502LT, PV31502LTSTD

RDI
Valves · Flowline · Manifolds
Recertification

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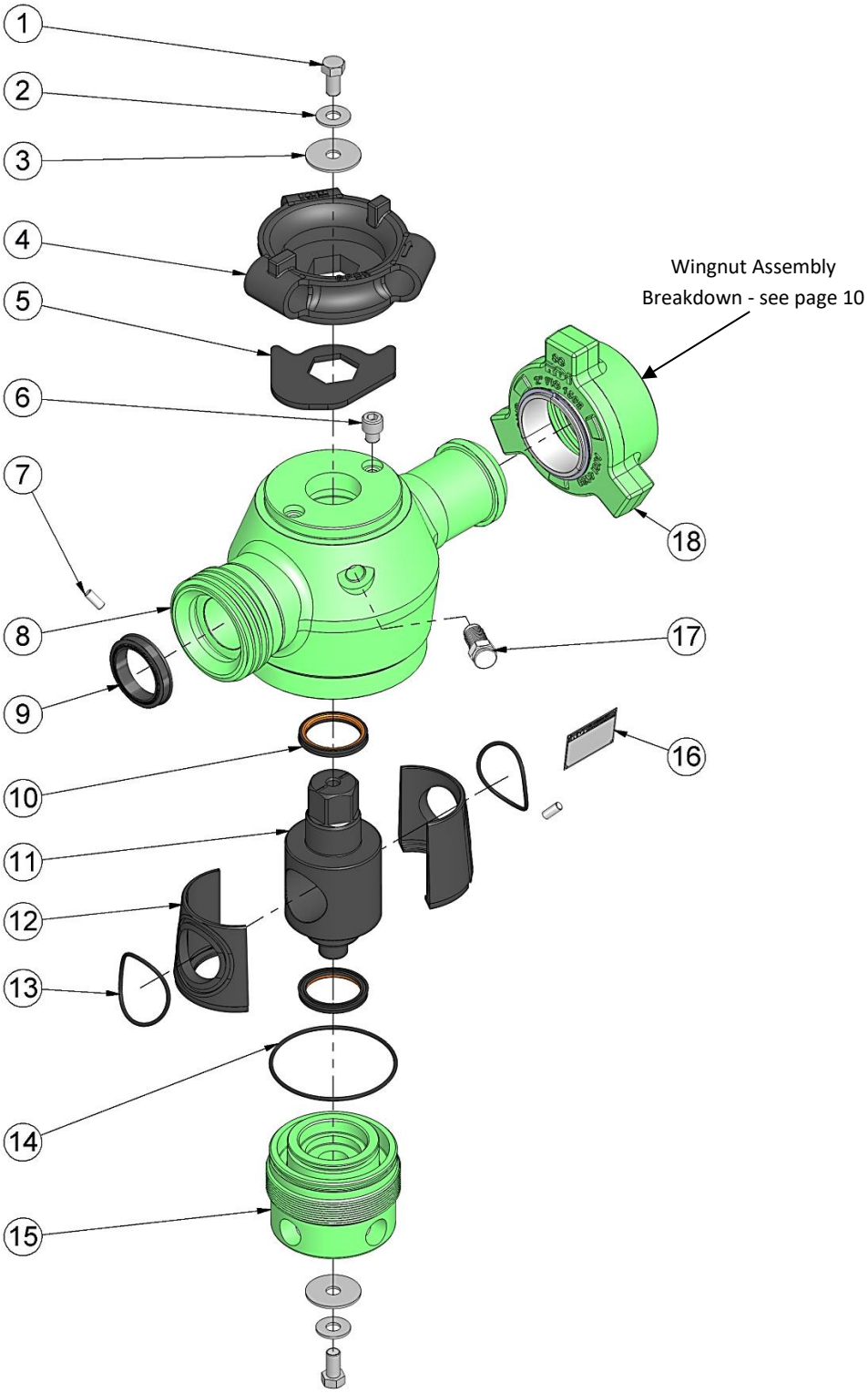
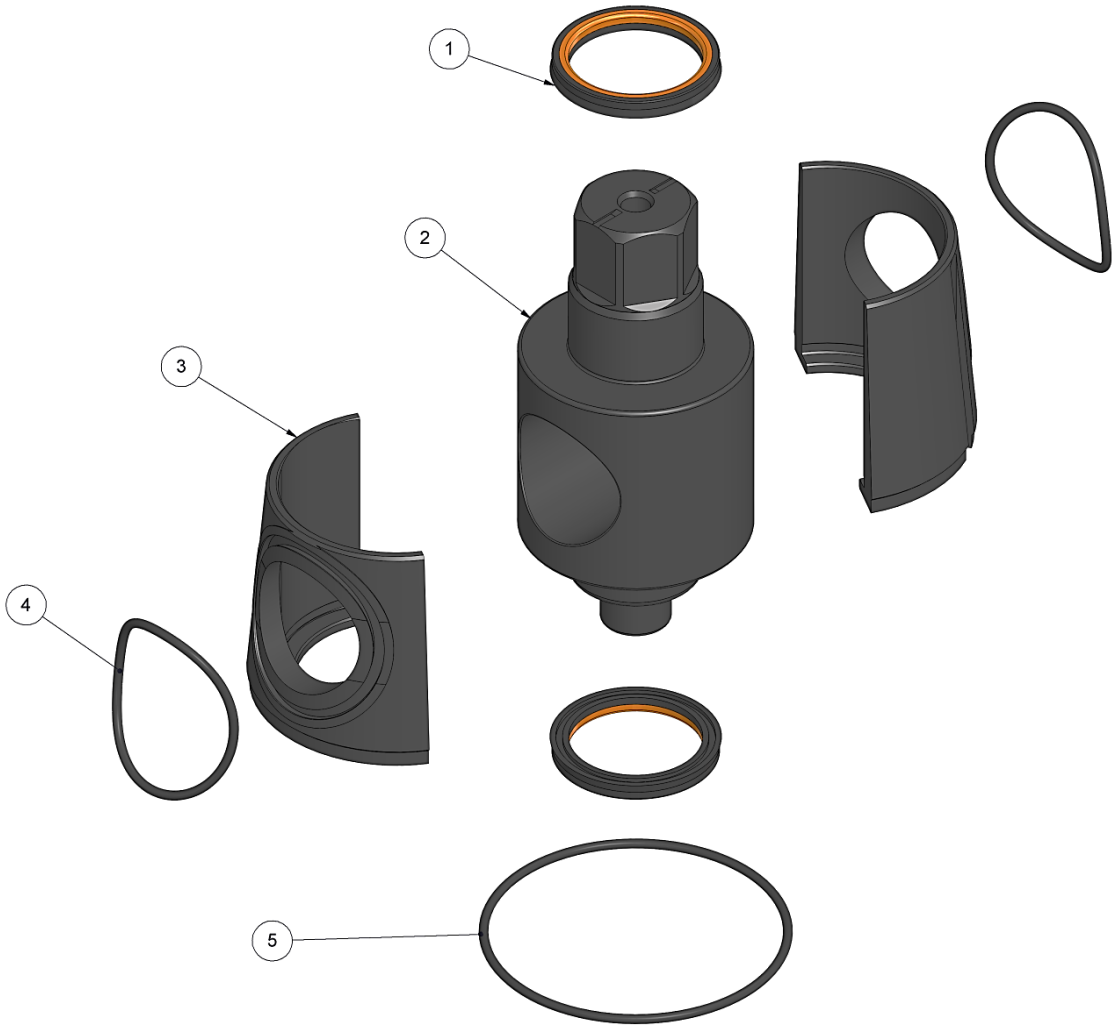
Exploded View - 2” 1502 LT Plug Valve



Parts Listing - 2” 1502 LT Plug Valve

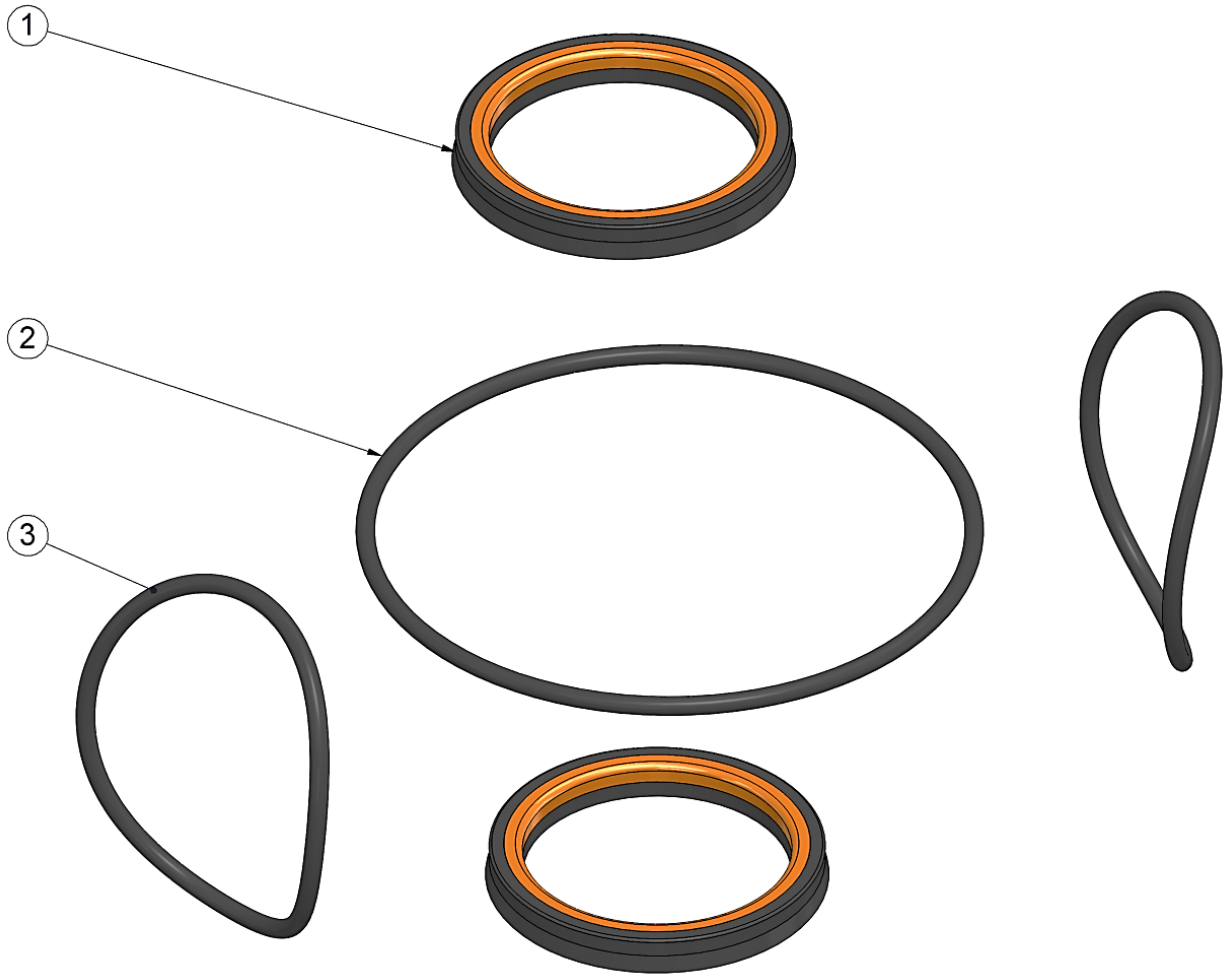
Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
1	2	Hex Bolt,1/2-20x1x1 THRD Length	HEX BOLT 0.5000-20x1x1-N	HEX BOLT 0.5000-20x1x1-N
2	2	Flat Washer-1/2	FW 0.5	FW 0.5
3	2	½ Flat Washer-Wide (2in OD)	PV2LTWASHERWIDE	PV2LTWASHERWIDE
4	1	Plug Valve Handle	PVHDL2X2LT	PVHDL2X2LT
5	1	Stop Plate	PV215HDLSTOPLT	PV215HDLSTOPLT
6	1	1/2” Socket Head Cap Screw	SHCS12X12	SHCS12X12
7	2	Grooved Pin	PV3PIN	PV3PIN
8	1	Plug Valve Body	PV21502LT	PV21502LTSTD
9	1	Union Seal - 2”	SEAL2	SEAL2STD
10	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
11	1	Plug Body	PV215FINPLUGLT	PV215FINPLUGLTSTD
12	2	Seat Carrier Body	PV215FINSEATCARRLT	PV215FINSEATCARRLTSTD
13	2	O-Ring	OR-H90-230	OR-N90-230
14	1	O-Ring	OR-H90-245	OR-N90-245
15	1	Cap Body	PV215BODCAPLT	PV215BODCAPLTSTD
16	1	Name Plate	VLVTAG	VLVTAG
17	1	Safety Tap Fitting	GBH34BT	GBH34BT
18	1	Wingnut Kit	WNKIT21502 (See page 10)	WNKIT21502STD (See page 10)

Major Repair Kit Parts Listing - 2” 1502 LT Plug Valve



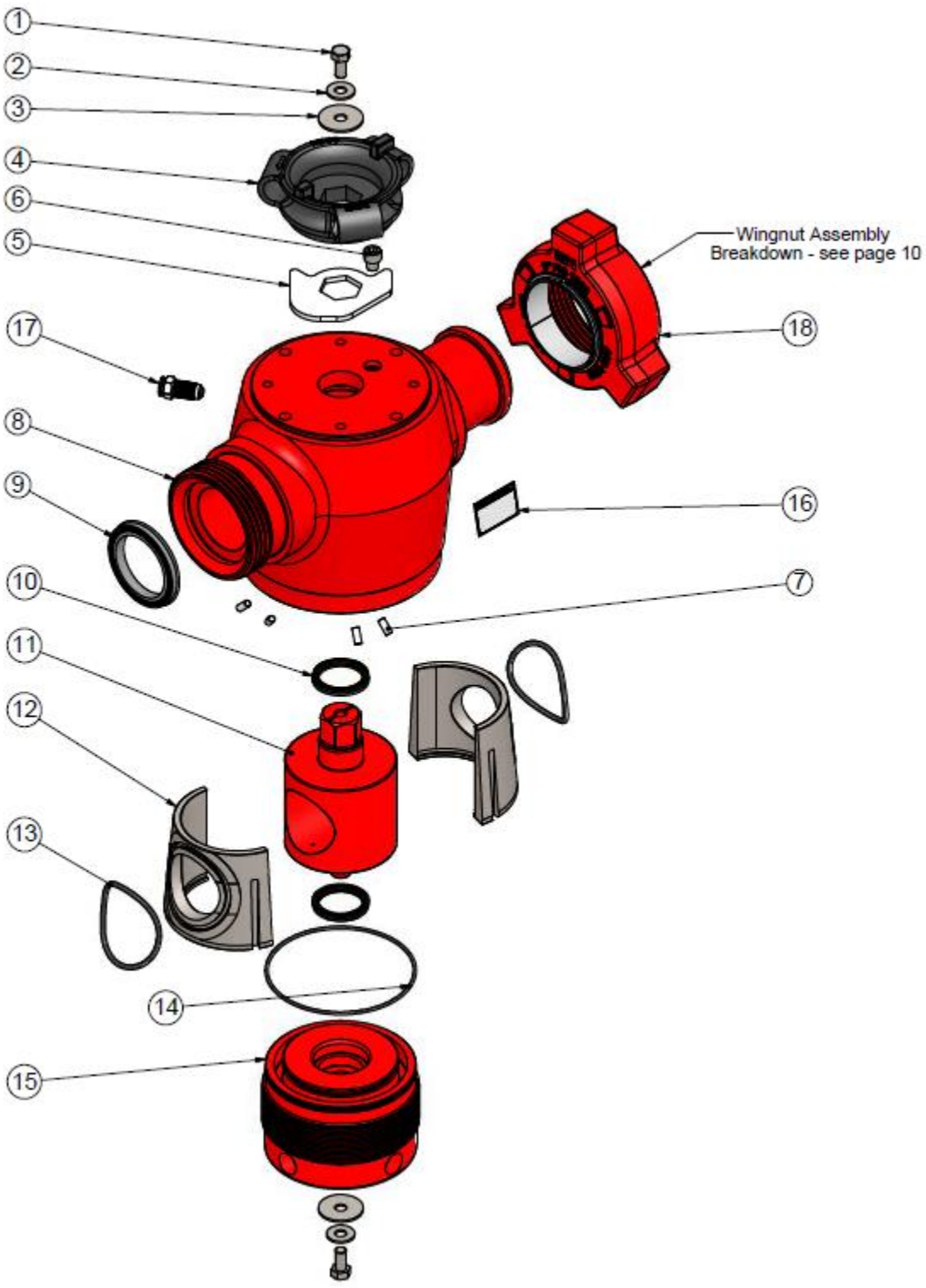
Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Major Repair Kit	**PVRK2LTMAJ**	**PVRK2LTMAJSTD**
1	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
2	1	Plug Body	PV215FINPLUGLT	PV215FINPLUGLTSTD
3	2	Seat Carrier Body	PV215FINSEATCARRLT	PV215FINSEATCARRLTSTD
4	2	O-Ring	OR-H90-230	OR-N90-230
5	1	O-Ring	OR-H90-245	OR-N90-245

Minor Repair Kit Parts Listing - 2” 1502 LT Plug Valve



Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Minor Repair Kit	**PVRK2LTMIN**	**PVRK2LTMINSTD**
1	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
2	1	O-Ring	OR-H90-245	OR-N90-245
3	2	O-Ring	OR-H90-230	OR-N90-230

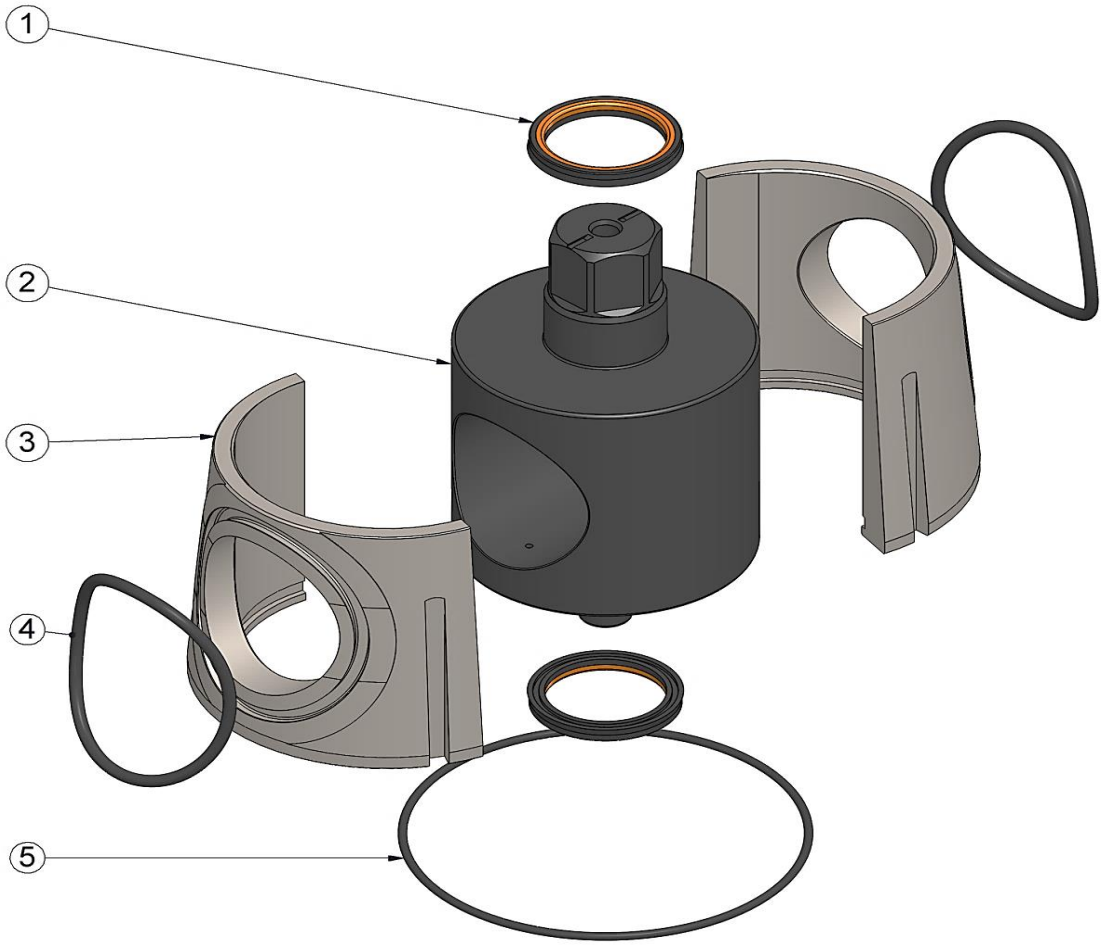
Exploded View - 3” 1502 LT Plug Valve



Parts Listing - 3” 1502 LT Plug Valve

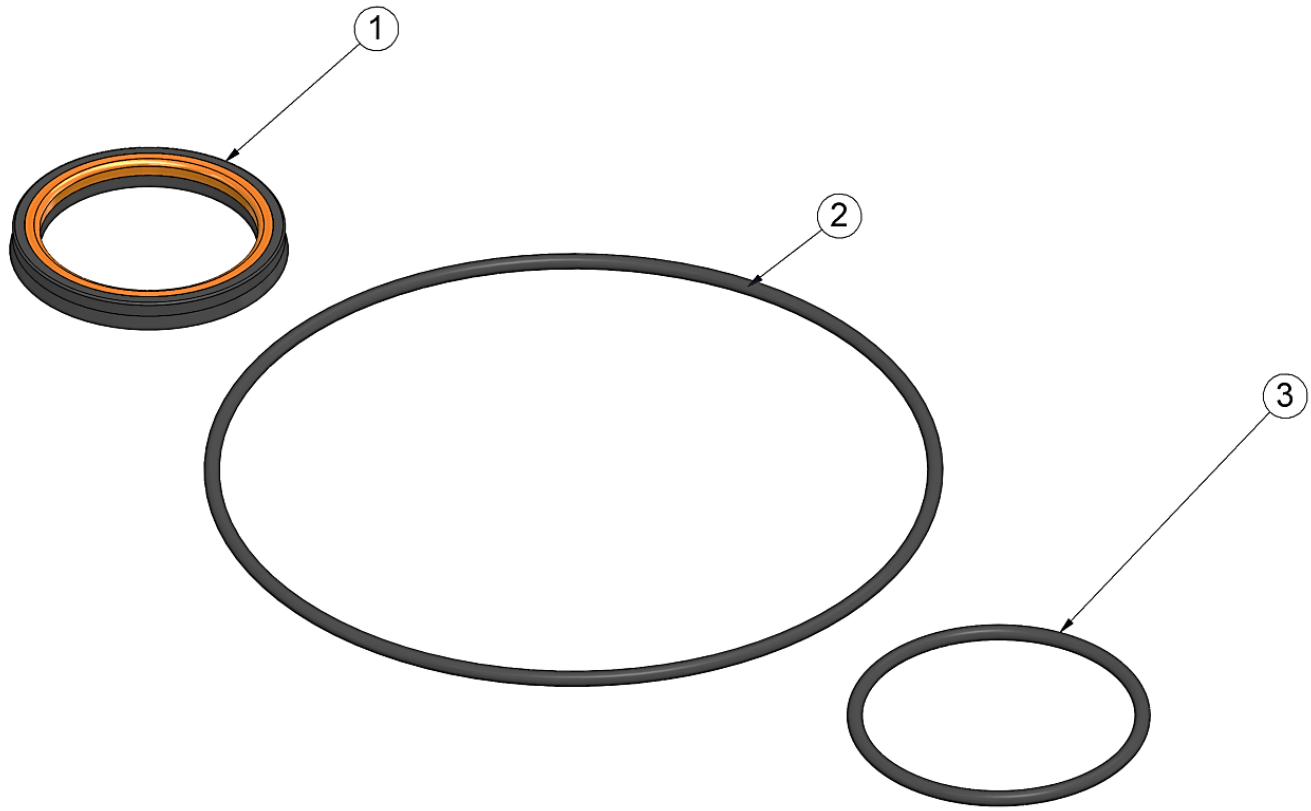
Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
1	2	Hex Bolt,1/2-20x1x1 THRD Length	HEX BOLT 0.5000-20x1x1-N	HEX BOLT 0.5000-20x1x1-N
2	2	Flat Washer-1/2	FW 0.5	FW 0.5
3	2	½ Flat Washer-Wide (2in OD)	PV2LTWASHERWIDE	PV2LTWASHERWIDE
4	1	Plug Valve Handle	PVHDL2X2LT	PVHDL2X2LT
5	1	Stop Plate	PV215HDLSTOPLT	PV215HDLSTOPLT
6	1	1/2” Socket Head Cap Screw	SHCS12X12	SHCS12X12
7	4	Grooved Pin	PV3PIN	PV3PIN
8	1	Plug Valve Body	PV31502LT	PV315LTSTD
9	1	Union Seal - 3”	SEAL3	SEAL3STD
10	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
11	1	Plug Body	PV315FINPLUGLT	PV315FINPLUGLTSTD
12	2	Seat Carrier Body	PV315FINSEATCARRLT	PV315FINSEATCARRLTSTD
13	2	O-Ring	OR-H90-343	OR-N90-343
14	1	O-Ring	OR-H90-259	OR-N90-259
15	1	Cap Body	PV315BODCAPLT	PV315BODCAPLTSTD
16	1	Name Plate	VLVTAG	VLVTAG
17	1	Safety Tap Fitting	GBH34BT	GBH34BT
18	1	Wingnut Kit	WNKIT31502 (See page 10)	WNKIT31502STD (See page 10)

Major Repair Kit Parts Listing - 3” 1502 LT Plug Valve



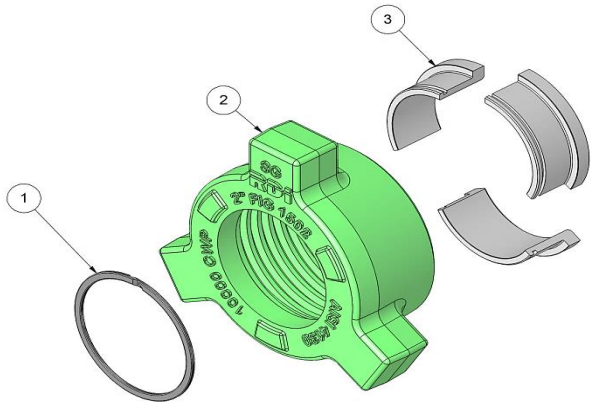
Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Major Repair Kit	**PVRK3LTMAJ**	**PVRK3LTMAJSTD**
1	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
2	1	Plug Body	PV315FINPLUGLT	PV315FINPLUGLTSTD
3	2	Seat Carrier Body	PV315FINSEATCARRLT	PV315FINSEATCARRLTSTD
4	2	O-Ring	OR-H90-343	OR-N90-343
5	1	O-Ring	OR-H90-259	OR-N90-259

Minor Repair Kit Parts Listing - 3” 1502 LT Plug Valve



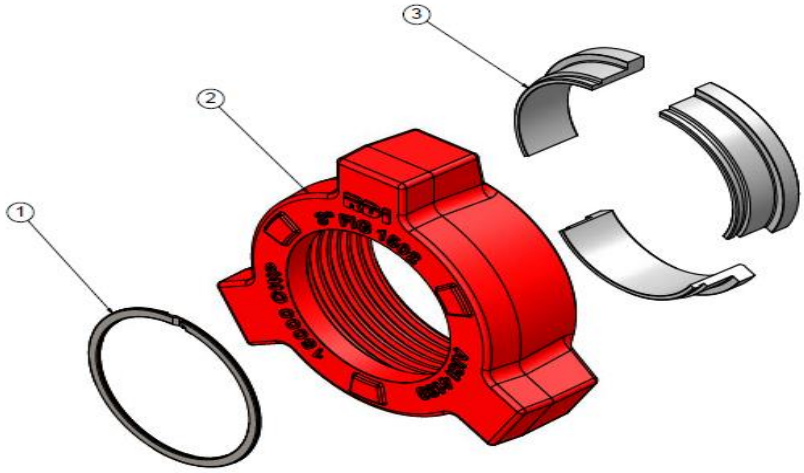
Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Minor Repair Kit	**PVRK3LTMIN**	**PVRK3LTMINSTD**
1	2	Plug Seal	PV215LTPLUGSEAL	PV215LTPLUGSEALSTD
2	1	O-Ring	OR-H90-259	OR-N90-259
3	2	O-Ring	OR-H90-343	OR-N90-343

Wingnut Kit Parts Listing - 2” 1502 LT Plug Valves



Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Wingnut Kit	**WNKIT21502**	**WNKIT21502STD**
1	1	Snap Ring	SNAPRINGWST334	SNAPRINGWST334
2	1	Wingnut	WN21502	WN215DETSTD
3	1	Segment Set (3)	SEG21502	SEG21502

Wingnut Kit Parts Listing - 3” 1502 LT Plug Valves



Item	Qty	Description	Part #: Sour (H_2S)	Part #: Standard
		Wingnut Kit	**WNKIT31502**	**WNKIT31502STD**
1	1	Snap Ring	SNAPRINGWST450	SNAPRINGWST450
2	1	Wingnut	WN31502	WN315DETSTD
3	1	Segment Set (3)	SEG31502	SEG31502 Rev.8 or Newer

Assembly Procedure

Pictorial Sample - 2" 1502 LT Plug Valve

It is important that the workstation is clean and free of any contaminants such as metal shavings, dirt, etc. Do not sand or de-burr any items while at the assembly workstation.

Note: RDI-6430 (assembly grease), RDI-2015 (performance grease) and Nikal (anti-seize compound) are used in this procedure. Use of grease other than that listed in this manual is not recommended as it may adversely affect the performance and functionality of the Plug Valve.

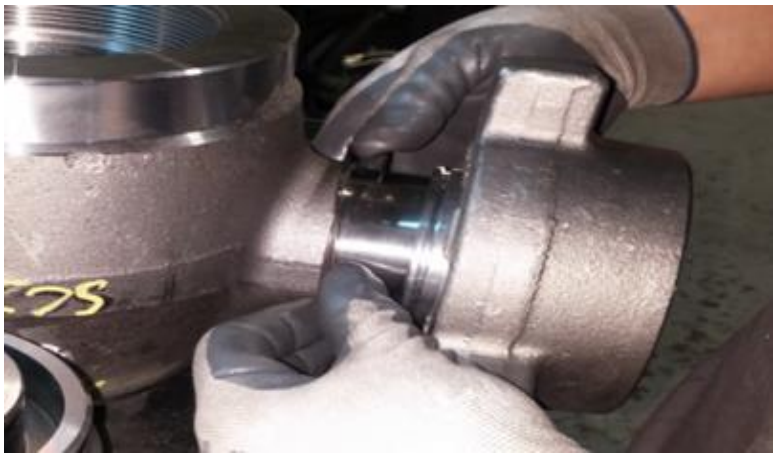
1. Clean and inspect all parts for any damage (i.e. dents, scratches, sharp edges and burrs), particularly on the sealing areas and threads prior to assembly.

2. Install the **Snap Ring (#18-1)** onto the male end of the **Plug Valve Body (#8)**.

   *Refer to page 10 for **Wingnut Assembly** breakdown.

3. Slide the **Wingnut (#18-2)** next to the **Snap Ring**. Place the **Segment Set (3) (#18.3)** around the male end and pull the **Wingnut** over the **Segments** to hold them in place.

4. Pry the **Snap Ring** around into the machined groove on the **Segments** to secure the **Wingnut Kit** together.



5. Insert the **Union Seal (#9)** into the inside groove at the female end of the **Plug Valve Body**.

Mount the **Plug Valve Body** on a bench receiver.

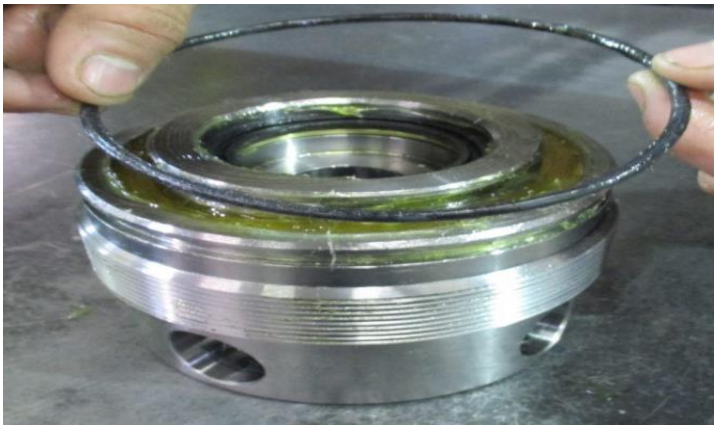
6. Insert and punch the **Grooved Pins (#7)** into the internal pin holes on both sides of the **Plug Valve Body**.

   Note: Insert **Pin** small end first. Use an air nozzle to blow out the inside of the **Valve** to remove any contaminants.

7. Apply a moderate amount of **assembly grease** to the **Plug Valve Body** seal pocket (the very bottom of the **Plug Valve Body**) and on the **Plug Seal (#10)**. Insert the **Plug Seal** into the **Plug Valve Body** seal pocket - copper plate facing down.

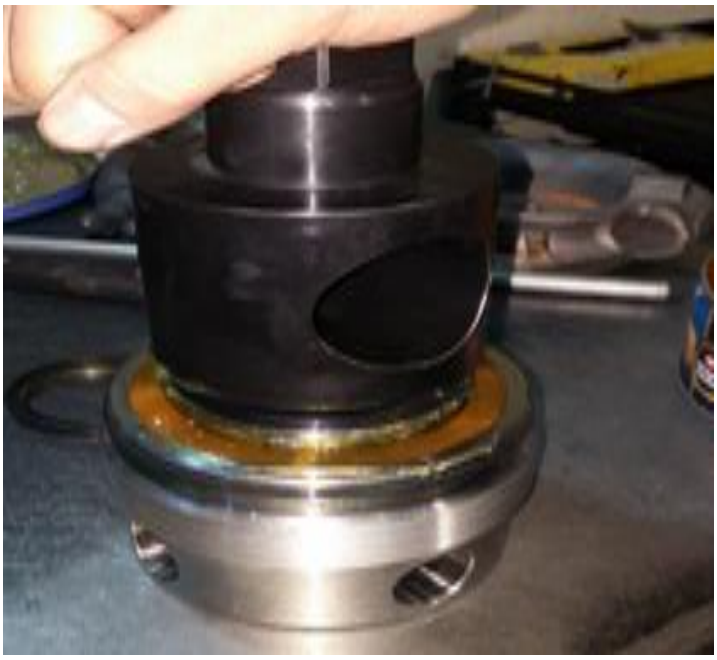
8. Pack the **Cap Body (#15)** with **grease** all around the open groove as shown. Apply **grease** into the seal pocket of the **Cap Body** and on **Plug Seal (#10)**. Insert the **Plug Seal** into the **Cap Body** seal pocket - copper plate facing down.

9. Lightly **grease** **O-Ring (#14)** and install into the outer groove of the **Cap Body**.



10. Apply **grease** onto the shafts of the **Plug Body (#11).** Press the **Plug Body** (hex end facing up) into the **Cap Body** using downward pressure until fully engaged.

    Note: A rubber mallet can be used to facilitate this step.



11. Turn the **Cap/Plug Assembly** upside down and secure it snugly with the **½" Hex Bolt (#1)** and **Washers (#2 & #3)**. Then apply a liberal amount of **grease** on the sealing surface of the **Plug Body.**

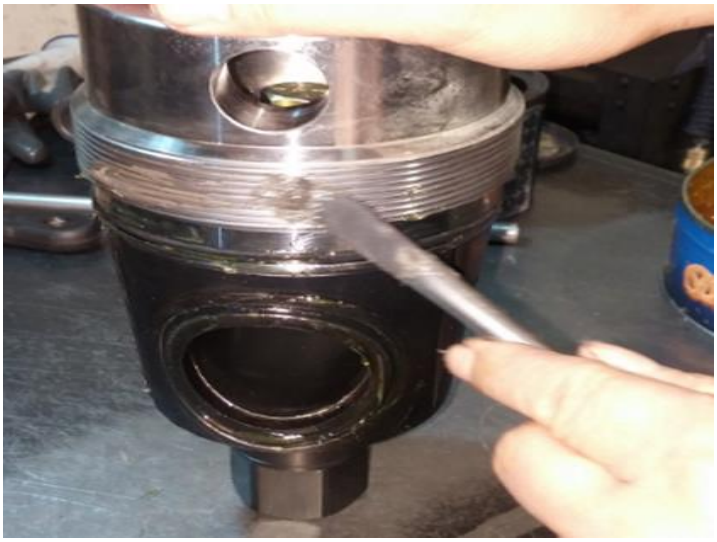
    Refer to **Exploded View - 2" 1502 LT Plug Valve** on page 2 for **Washer** orientation.

12. Apply **grease** on **O-Rings (#13)** and install into the groove of the **Seat Carriers (#12)**. Then apply **grease** on the sealing area of the **Seat Carriers** - concave side.

13. Clip the **Seat Carriers** around the **Plug Body** - anchoring them on the groove of the **Cap Body** as shown.

    Note: Align the bores of the **Seat Carriers** and the **Plug Body.**

14. Apply an **anti-seize compound** on the external threads of the **Cap Body** and onto the corresponding threads of the **Plug Valve Body**.



15. Apply a moderate amount of **assembly grease** on the internal wall of the **Plug Valve Body**, then slowly insert the **Plug/Cap/Seat Carrier** assembly into the **Plug Valve Body** while maintaining bore alignment with the bore of the **Plug Valve Body.**

    Note: Ensure that the notch on both **Seat Carriers** will pass freely on the **Grooved Pins**.

16. Using a bar, tighten the **Cap Body** until snug, then back off a ¼ turn to allow free movement of the **Plug Body**.

    Note: After backing off a ¼ turn, check if there is still good bore alignment on the **Plug, Seats** and **Plug Valve Body**. Adjust if necessary.

17. Apply an **anti-seize compound** on the threads of the **Safety Tap Fitting (#17)** and screw it **clockwise** into the side threaded port on the **Plug Valve Body**. Torque the **Safety Tap Fitting** to 80 ft. lbs.

DO NOT use Teflon tape on the **Safety Tap Fitting****

18. Apply an **anti-seize compound** on the threads of the **Socket Head Cap Screw (#6)** then thread it into the hole (male end side) of the **Plug Valve Body** as shown.

19. Slide the **Stop Plate (#5)** onto the **Plug Body** hex as shown for proper orientation - **open position**.

Note: Ensure that position of the **Plug Body** corresponds to the open/closed positions of the **Stop Plate** when turning the **Plug**.

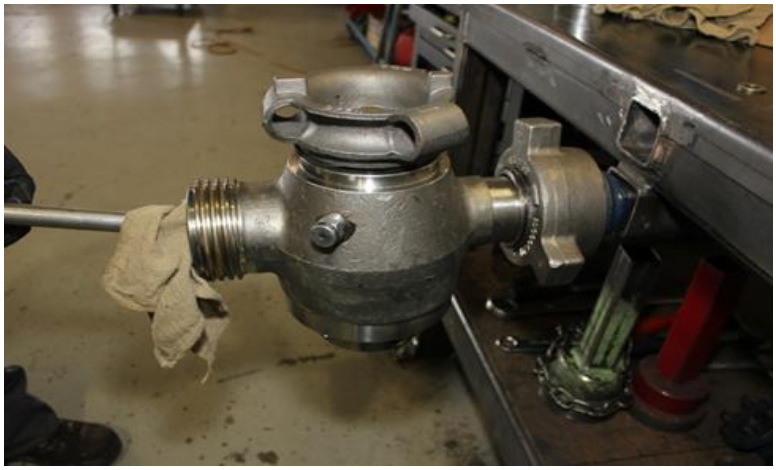
20. Place the **Plug Valve Handle (#4)** over the **Stop Plate** with indicator tabs aligned to the **Plug Valve Body**.

21. Secure the **Handle** with the **Hex Bolt (#1)** and **Washers (#2 & #3**) - tighten till snug. Recheck the **1/2 Hex Bolt** on the other end of the **Plug** - tighten if necessary.

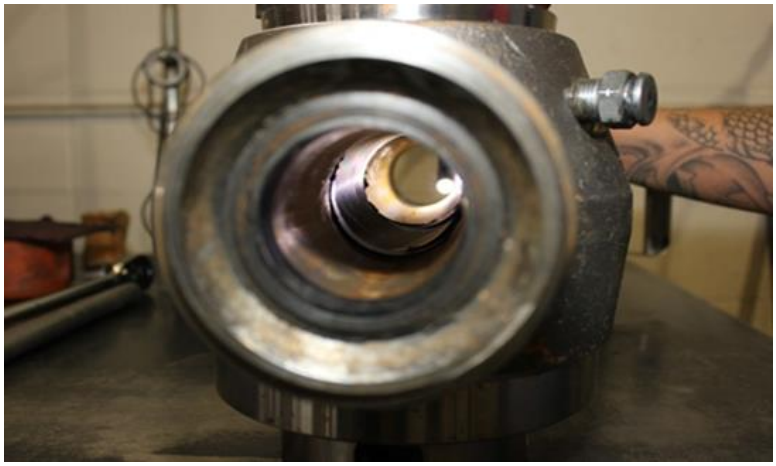
22. **Grease** the **Plug Valve** with **RDI-2015 performance grease** before and after hydro test.

Refer to **Greasing Instructions** on Page 21.

23. Remove the excess **grease** in the bore of the **Plug Valve** by pushing a clean rag through the bore.



24. Complete a final inspection to ensure that the bores of the **Plug**, **Seats** and **Valve Body** are aligned in the open position. Adjustment can be done by threading the **Cap** in or out of the **Body** as required.



Greasing Instructions

Ensure you have the most recent version of the RDI Greasing Instructions by visiting:

https://rdironworks.com/products/plug-valves/

or contact our sales team, toll-free:

1.855.973.4766

Button Head Grease Fitting

The image below is the Safety Tap Fitting used on the RDI Low Torque Valves.

Tear-Down Procedure

WARNING: If the **Plug Valve Handle (#4)** or the **Cap Body (#15)** is hard to cycle or turn and the **Plug Valve** seems to be stuck or locked, there may be pressure trapped in the **Valve**, also known as "pressure locking". If this happens, **DO NOT** continue to tear-down a **Pressure Locked Plug Valve**. (See Pressure Relieving Procedure for instructions).

- Remove the **Hex Bolt (#1)** and **Washers (#2 & #3)**, the **Plug Valve Handle (#4)**, and the **Stop Plate (#5).**
- Turn the **Plug Valve** over so the **Cap Body (#15)** is facing up. Keep the bottom **Hex Bolt (#1)** in place and remove the **Cap Body (#15)** by turning **counter-clockwise**. This will enable the entire internal assembly [**Seat Carrier Body (#12)** and **Plug Body (#11)**] to be removed as a unit from the **Plug Valve Cavity**.
- Remove the **Hex Bolt (#1)** that connects the **Plug Body (#11)** to the **Cap Body (#15)**.
- Remove the **Seat Carrier Body (#12)** and the **Plug Body (#11)**.
- Remove the **Seat Carrier O-Rings (#13)**, **Cap Body O-Ring (#14)** and the **Plug Body Seals (#10)**.

Pressure Relieving Procedure

Pressure locking is caused by a rapid decrease in line pressure which traps fluid at the original line pressure. The trapped pressure causes a net upward force of the plug due to a differential in pressure area from top to bottom.

Best Practice for relieving trapped pressure in a **Plug Valve**. Connect the **Valve** and bring it to its last highest pressure. This will set the internal components in equilibrium and allow you to actuate the **Valve** while gradually decreasing the in-line pressure. This will ensure the **Plug** maintains freedom of rotation.

The **Safety Tap (Button Grease) Fitting (#17)** also allows the user to safely relieve the trapped pressure within the **Plug Valve**. One must exercise extreme caution when attempting to relieve a **Pressure Locked Valve**. Start by **SLOWLY** turning the **Safety Tap Fitting (#17)** a ¼ turn **counter-clockwise** to begin releasing the pressure. Actuate the **Valve** to ensure that all pressure has been released.

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Valves · Flowline · Manifolds
Recertification