

IRON GATE & GLOBE VALVES

SL201, SL600, SL601



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PIPELINE VALVE®**



AUSTRALIAN PIPELINE VALVE®

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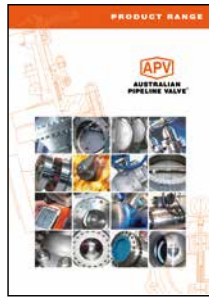
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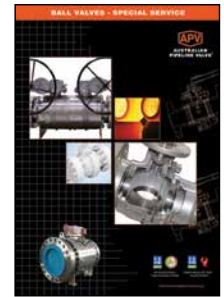
Product Brochure



Ball Valves Floating & Trunnion Mounted



Ball Valves Floating Small Bore



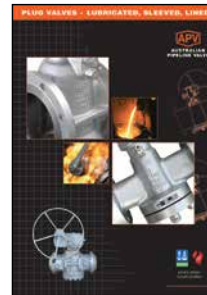
Ball Valves Special Service



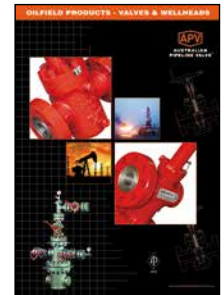
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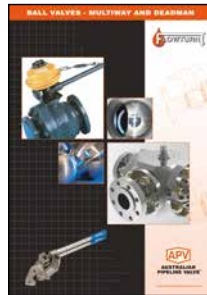


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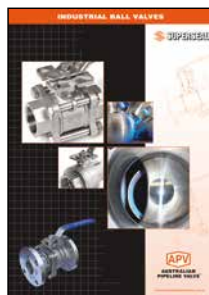
Steamco Steam Valves



Supercheck Wafer Check Valves



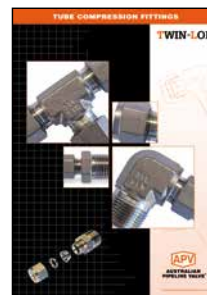
Superseal Butterfly Valves



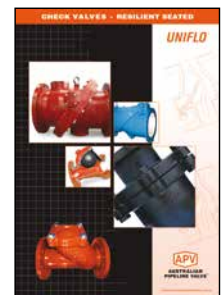
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Torqturn Actuators



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INDEX



Introduction	2
Safety Information	3-4
1.0 Installation	5
1.1 Installation positions	5
1.2 Preparation for installation	5
2.0 Handling	5-6
3.0 Operation	6
4.0 Gear Operators	6
5.0 Difficulty Opening & Closing	6
6.0 Leakage Across Seat	7
7.0 Disassembling Valves	7
8.0 Reassembly	7
9.0 Preventative Maintenance	8
10.0 Stem Packing/ Back Seating	8
11.0 Preventing Leakage Across Bonnet Gasket	8
12.0 Major Maintenance	8-11
12.1 Stem & disassembly gland/yoke	9
12.2 Disassembly of stem packing	9-10
12.3 Stem replacement & valve disassembly	10
12.4 Valve reassembly	10-11
Appendix A - Bolting torque sequence	12



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INTRODUCTION

The majority of this information is common knowledge to experienced valve users. When properly installed in applications for which they were designed, Flowturn valves will give long reliable service. This instruction is only a guide for installation and operation on standard service and covers general maintenance and minor repairs. A professional APV approved valve engineering facility should be utilised for reconditioning or major repairs.



Note

We do recommend however that this entire document be read prior to proceeding with any installation or repair. Australian Pipeline Valve and its parent company take no responsibility for damage or injury to people, property or equipment. It is the sole responsibility of the user to ensure only specially trained valve repair experts perform repairs under the supervision of a qualified supervisor.

RESPONSIBILITY FOR VALVE APPLICATION

The User is responsible for ordering the correct valves. The user is responsible for ensuring APV-Flowturn Valves are selected and installed in conformance with the current pressure rating and design temperature requirements. Prior to installation, the valves and nameplates should be checked for proper identification to ensure the valve is of the proper type, material and is of a suitable pressure class and temperature rating to satisfy the requirements of the service application.



Caution

Do not use valves in applications where either the pressure or temperature is higher than the allowable working values. Also valves should not be used in service media if not compatible with the valve material of construction, as this will cause chemical attacks, leakage, valve failure.

RECEIVING INSPECTION AND HANDLING

Valves should be inspected upon receipt to ensure:

- Conformance with all purchase order requirements.
- Correct type, pressure class, size, body and trim materials and end connections.
- Any damage caused during shipping and handling to end connections, hand wheel or stem.



Caution

The User is advised that specifying an incorrect valve for the application may result in injuries or property damage. Selecting the correct valve type, rating, material and connections, in conformance with the required performance requirements is important for proper application and is the sole responsibility of the user.

SAFETY INFORMATION

The following general safety information should be taken in account in addition to the specific warnings and cautions specified in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered in this I.O.M.



Caution

To avoid injury, never attempt disassembly while there are pressures either upstream or downstream. Even when replacing stem packing, caution is necessary to avoid possible injury.



Caution

To prevent valve bending, damage, inefficient operation, or early maintenance problems, support piping on each side of the valve.



Caution

- *A valve is a pressurised mechanism containing energised fluids under pressure and consequently should be handled with appropriate care.*
- *Valve surface temperature may be dangerously too hot or too cold for skin contact.*
- *Upon disassembly, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.*
- *Ensure adequate ventilation is available for service.*

This manual provides instructions for storing, general servicing, installation and removal of gate and globe valves.

APV and its resellers refuse any liability for damage to people, property or plant as well as loss of production and loss of income under any circumstances but especially if caused by: Incorrect installation or utilisation of the valve or if the valve installed is not fit for intended purpose. It is the sole responsibility of the user to ensure the valve type and materials are correctly specified.

DURING OPERATION TAKE INTO ACCOUNT THE FOLLOWING WARNINGS:

- a- Graphite/Graphoil packing and body gaskets are very brittle, any impacting, twisting or bending should be avoided.
- b- The valve's internal parts such as disc, stem, seats, seals, gaskets shall be handled with care avoiding scratches or surface damage.
- c- All tools and equipment for handling the internal parts shall be soft coated.
- d- Valves can be fitted with gaskets or seals in PTFE, Buna, EPDM, NBR, Viton, etc., hence chemicals or high temperatures will damage sealing components.
- e- Never part open valve or part close, gate valves must be full open or full closed to avoid seat damage. Globe valves can be used to throttle (on clean service only) for short periods but must be at least 25% open or else venturi action will damage seating area and body.

For all operations make reference to position number on part list of the applicable drawing listed.



Caution

Packing leakage could result in personal injury. Valve packing is tightened prior to shipping but may require readjustments to meet specific service conditions.



Caution

Personal injury may result from sudden release of any process pressure. APV recommends the use of protective clothing, gloves and eye wear when performing any installation or maintenance.

Isolate the valve from the system and relieve pressure prior to performing maintenance.

Disconnect any operating line providing air pressure, control signals or electrical power to actuators.



Caution

Check the packing box for pressurised process fluids even after the valve has been removed from the pipeline, particularly when removing packing hardware or packing rings, or removing packing box pipe plug if fitted.



Caution

If a gasket seal is disturbed while removing or adjusting gasketed parts, APV recommends installing a new gasket while reassembling. A proper seal is required to ensure optimum operation.

1.0 INSTALLATION



Caution

Piping should be properly aligned and supported to reduce mechanical loading on the end connections.

1.1 INSTALLATION POSITIONS

Gate valves are usually bi-directional, and therefore may be installed in either direction. In some cases, gate valves may be unidirectional, in which case the direction of flow will be indicated on the valve body. Globe valves are uni-directional, install in direction shown by arrow on body.

Gate & Globe valves should be installed with the stem in a vertical up position on horizontal lines. Never install with the stem below the horizontal axis, as complete drainage is not possible and solids may accumulate in the valve bonnet, which will greatly affect the valve operation and service life. If valves are to be installed in vertical lines, please specify at time of order as this is non standard.

1.2 PREPARATION FOR INSTALLATION

- Remove protective end caps or plugs and inspect valve ends for damage to flange faces.
- Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation.
- Verify that the space available for installation is adequate to allow the valve to be installed and to be operated.



Note

Ensure sufficient clearance for the stem in the full open position. Inadequate clearance for valves may add mechanical loading to the valve ends. Sufficient clearance should be allowed for threaded end valves to be 'swung' during installation.

2.0 HANDLING

1. Take care in handling valves especially the sealing faces.
2. Make sure that piping and equipment is clean of dust, rust and pipeline scale. Clean all adjoining pipe and fittings. Remove end protector covers from the valves immediately prior to installation. Blow compressed air inside the valves to remove residual dust, dirt, etc., from inside the valves as this could hamper the valves functioning and could also damage the seats.
3. Make joints tight but do not overstress them. This is very important when your tightening gland packing nuts. Always tighten in a diagonal pattern, gradually increasing torque settings.
4. Install valves in the connecting piping so that the arrow mark on the valve body coincides with the flow direction in the pipe. (Gate valves can be bi-directional).

5. After installation it is advisable to once again flush the piping. Check carefully for visible leaks if any and tighten stem packing and/or bonnet nuts accordingly.
6. If the leakage still persists change the bonnet gasket.

3.0 OPERATION

1. Check visibly for any leaks and re-tighten the joints/glands.
2. Manually operated valves are to be operated through handwheel. To open the valve, turn the handwheel anti-clockwise. To close the valve, turn the handwheel in clockwise direction.
3. Turn the handwheel slowly initially so as to prevent undue stress on the valves due to thermal gradient, water hammering, etc.
4. Never use too much force for either closing or opening the valve, never attempt to apply leverage with a long lever as this could damage yoke nut.

4.0 GEAR OPERATORS

The gear operator is lubricated with grease (2% MOS2) for life.

Only in case of failure of any components remove the upper gear casing from lower gear casing. After inspection replace the necessary components.



Do not dismantle the upper and lower gear casing as it will disturb the whole assembly and the deep groove ball bearings, the operator provided is properly lubricated for long life.

1. When repairing the drive sleeve and bearing (thrust ball bearing) there should not be any clearance, i.e. the drive should not move axially.
2. Proper installation will correct operation.

5.0 DIFFICULTY OPENING & CLOSING

For manual operated valves, loosen the two gland tightening nuts and the spindle should become free (otherwise dismantle the valve bonnet to inspect).

After dismantling the valve bonnet, inspect the exposed part of the spindle for scouring marks. Smooth out these marks with fine emery paper. Lightly lubricate the spindle and the spindle should become free again.

6.0 LEAKAGE ACROSS SEAT

It is always difficult to ascertain whether there is an internal seat leakage unless there is pressure or leak detection facility in place to monitor any rise or fall in pressure or leakage. Globe valves allow a higher rate of seat leakage than gate valves, consult appropriate test standard for leakage allowance.

To investigate suspected leakage, the valve should be removed from the line then dismantled. Prior to removal from line ensure all pressure and fluid is purged from line and valve cavity. Remove disc and inspect the seating surfaces, also inspect the body seat for any sign or wire drawing/light scratches.

Relap the seats or disc as required if minor damage or else send the valve to an experienced APV approved valve repair facility. Assemble the valve, should any leaks still persist then the concerned part may need complete replacement.

When ordering spare parts for replacements, kindly inform us the size, type, rating, part description, model number and serial number.

7.0 DISASSEMBLING VALVES

1. Check that the line is in a complete shut down phase.
2. Pre-order all necessary spare gland packings and jointing gaskets.
3. Open the valve slightly by turning the handwheel anti-clockwise and loosen the gland.
4. Put identification markings on valve body, bonnet, disc/gate, yoke, and actuator. This helps to avoid mismatching of parts at the time of re-assembly.
5. If the bolts and nuts are too tight, apply deep penetrating oil and then unscrew.

Also refer to details in 12.1, 12.2 and 12.3.

8.0 REASSEMBLY

1. Re-assemble in reverse order of disassembly.
2. For larger valves, lift up the bonnet using lifting lugs where provided. For smaller valves, gently and evenly break the bonnet seat with a lever (if required) before lifting the bonnet off (where required use with a sling mechanical lifting device). Clean gasket surface areas, replace gasket and refit bonnet.
3. Refer Appendix A for bonnet bolt re-tightening procedure.

Also refer to details in 12.4.



9.0 PREVENTATIVE MAINTENANCE

1. Inspect whether all valves can be opened or closed smoothly at least once a month. If the operation is sluggish, clean the spindle threads and lubricate the same.
2. Check the gland tightening nuts for any slackness, if required tighten these nuts and ensure that the valve operation is not hampered by over tightening the gland.

Note, use suitable new gland packing rope/rings of correct size and type when replacing.



Caution

Do not attempt to repack the stem packing in line while the valve is under pressure. The line must be totally purged. Cast iron valves do not all have the 'back seating' feature. Prior to removing bonnet, exercise extreme caution no pressure is trapped in the valve cavity. Wear appropriate safety apparel and follow industry and plant safety procedures.

10.0 STEM PACKING/ BACK SEATING

Use Graphite (Graphoil)/PTFE impregnated Graphoil/Pure PTFE packings as per permissible limits of line pressure, temperature as well as media of flow through the valves. Some styles only have an O-ring stem seal system so ensure the grade of O-rings suits the service media and temperature.

If back seating feature is provided, for normal operation in the open position, the stem should be backed off so that the backseat is not in contact. This permits the stem packing to assume it's intended sealing function and not conceal unsatisfactory stem packing. In the event of stem packing leakage, the back seat can be used to stop stem leakage until circumstances permit a system shutdown and time for packing replacement. Stem packing replacement with the valve under pressure and backseated represents a hazard and should not be undertaken. The hazard is magnified as fluid pressure or temperature increases or when the fluid is toxic.

11.0 LEAKAGE ACROSS GASKET

Should any bonnet gasket leaks occur, tighten the bolts/nuts & studs (refer Diagram 2, Appendix A). If leakage still persists, the bonnet gasket should be changed.

12.0 MAJOR MAINTENANCE

Only an expert valve re-conditioner should attempt the following major extraordinary maintenance/repairs.

12.1 STEM & DISASSEMBLY GLAND/YOKE

If the stem locks or “freezes”, causes can generally be attributed to dry worn packing or a dry yoke nut. In either of these cases, the following service is required:

- a) Unscrew gland nuts, remove the gland flange and bushing to expose stem packing and lantern ring (where applicable). Replace stem packing if it is damaged. If the lantern ring is seized, completely disassemble the stem and replace the lantern ring (where one is fitted).
- b) Check lubrication of yoke nut. If it is dry, remove the yoke nut and determine if there is evidence of seizure marks. If so replace it with a new yoke nut.

12.2 DISASSEMBLY OF STEM PACKING

It is important that prior to servicing, the valve be opened to its fullest extent and the line be totally purged of any pressure (eye safety goggles should be worn). Partially unscrew nuts to reduce the compression load on the stuffing box. Remove the stem packing or seals.

12.2.1 Stem Packing Replacement

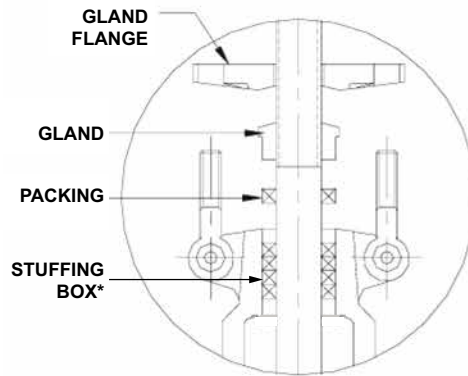


Caution

First remove the valve from the line. To prevent injury ensure that all fluid and pressure is removed from the valve both upstream and downstream before removal and disassembly. When removing drain or stem plug wear protective eye masks to avoid injury.

1. Check tightness of valve operation to serve as a reference when re-tightening. Remove gland nuts and the hook. Lift the gland up the stem clear away from the packing chamber.
2. Remove the defective packing rings or seals with a sharp tool or packing hook. Do not scratch or score the machined surfaces of the stem or packing chamber.
3. Examine the machined surfaces of the stem and packing chamber. Remove any scratches, scoring or burrs with an emery cloth or by hand filing. Clean the stem with a solvent soaked rag.
4. Count original number of rings and measure x-section thickness.
5. Order and then install new packing or seals.
6. When packing chamber becomes filled with packing (or in case of O-ring seal system the O-rings are replaced), reassemble gland and gland flange. Alternate tightening gland flange nuts 1/4 turn at a time until eyebolts begin to get tight. (If gland travels more than the height of one packing ring into the packing chamber, insert one more ring and repeat step 6. until chamber is filled).
7. Compare valve operation to original tightness. If valve operation is considerably tighter than original operating tightness, back off 1/4 turn on each gland nut & recheck tightness.
8. Several hours after a repacked valve has been returned to service, inspect the packing area to ensure full compression, tight bolting and no leakage. Should leakage occur, tighten gland nuts at 1/4 turn increments until leakage stops.

DIAGRAM 1



*Model SL600 and SL201 may have O-ring seals in lieu of packing, dependent on size and class.



Note

The stem packing style will vary according to valve size, type and class as well as the stem packing material specified.

12.3 STEM REPLACEMENT & VALVE DISASSEMBLY

To replace the stem when the valve is completely disassembled for general maintenance follow this procedure:

- Open valve half way then remove bonnet bolts and nuts.
- Lift up the bonnet to remove disc or wedge.
- With the bonnet removed, unscrew the gland bolts then lift up gland flange exposing the stem packing.
- Remove stem packing above the lantern ring (if so required) and then turn the hand wheel to force the stem down.
- Remove the stem through the stuffing box.

Also refer to 7.0



Caution

Always be sure that the valve is de-pressurised and isolated prior to performing any maintenance work. Do not attempt to repair valve in-line if volatile, dangerous, hazardous or flammable service. Always wear fully enclosed, splash proof, protective eye wear.

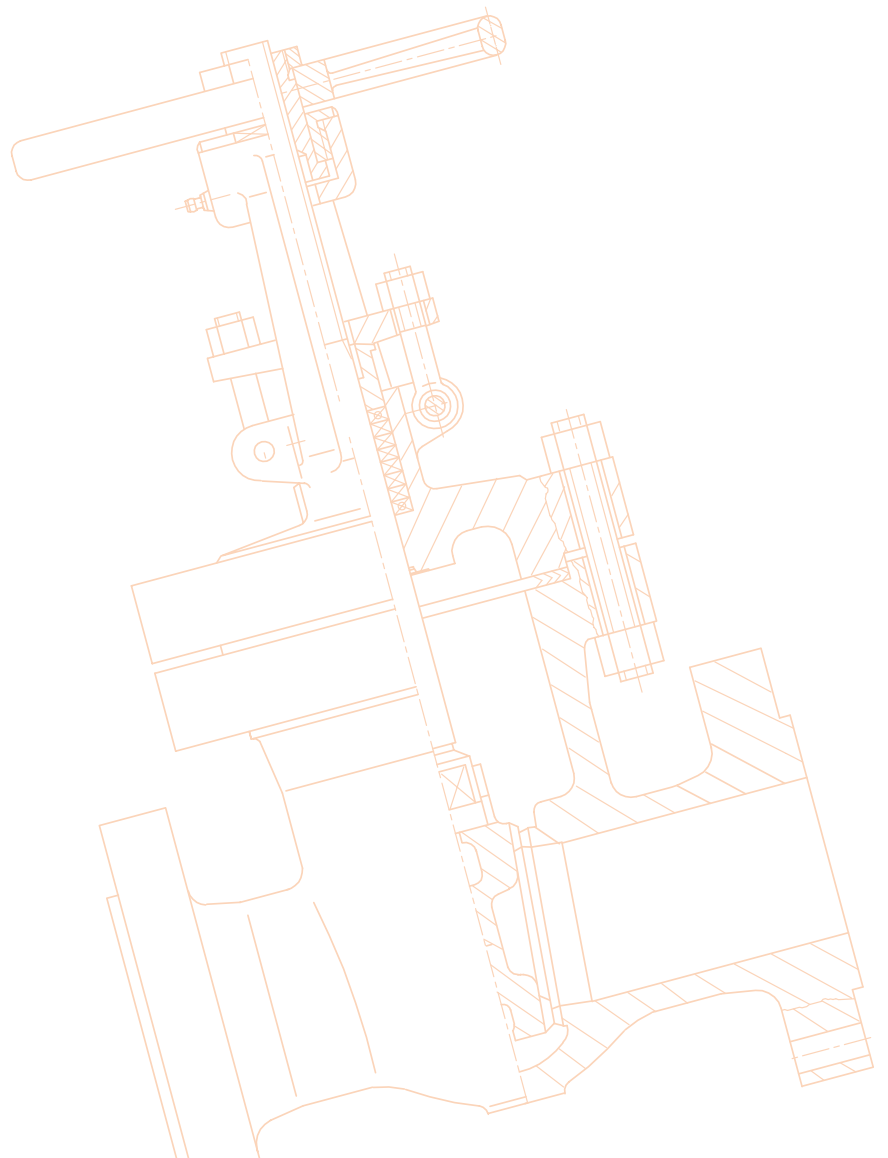
12.4 VALVE REASSEMBLY

The procedure to reassemble the valve is as follows:

Re-insert the stem through the stuffing box taking special care to reassemble parts in sequence. Next, insert the packing (or seals) into the stuffing box and compress using the gland and flange. Then, reassemble nuts and tighten.

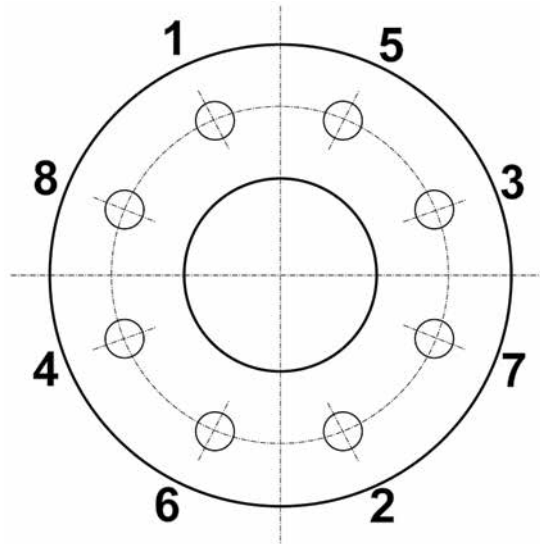
Note, the stem must slide freely through the stuffing box without applying excessive force. Finally, install the bonnet gasket making sure it is not damaged. The gasket should be replaced if there is any question as to its performance (refer 11.0).

Raise the bonnet, making sure the stem is in the half open position, then connect disc to stem. Always fit a new bonnet gasket then lower the bonnet on to the valve body making sure that the disc fits exactly into body guides and the bonnet is properly seated. Align holes and tighten bonnet nuts taking care that excessive force is not used, to avoid damaging the gasket. Do not over tighten bolts. Hydrostatically test the valve to ensure that there is no leakage. Refer to Diagram 2, Appendix A for bolt tightening sequence.



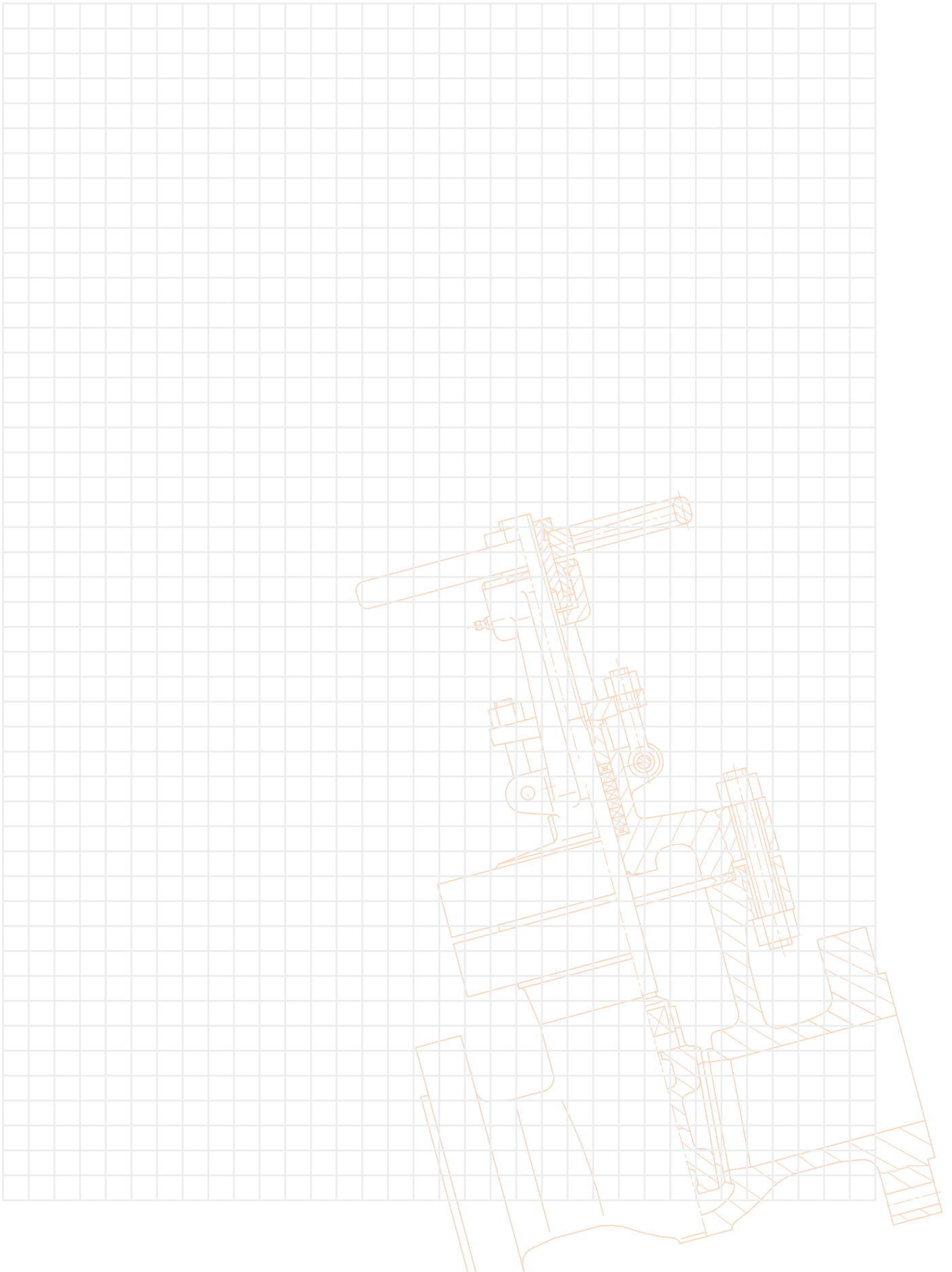
APPENDIX A

DIAGRAM 2



Bolting torque sequence: 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8

Example only, number of bolts will vary, apply the same criss cross process, gradually tightening more after each revolution.





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