INSTALLATION, OPERATION AND MAINTENANCE MANUAL

ECO-Centric™ Plug Valve

Figure 517, 3” to 24” with Adjustable Packing

TABLE OF CONTENTS

Introduction 2
Valve Construction 2
Description of Operation 2
Adjustable Packing Feature 2
Receiving & Storage 2
Installation 3
Operation 3
Preventive Maintenance 4
Trouble Shooting 4
Disassembly 4
Order Replacement Parts 5
Figure 517 Drawings/Parts Lists..... 6
Actuator Cross-Reference Chart 10
Warranty 11

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WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

INSTALLATION, OPERATION and MAINTENANCE
Figure 517 ECO-Centric™ Plug Valve

INTRODUCTION
This manual will provide the information to properly install, operate and maintain the valve to ensure a long service life. GA Industries ECO-Centric Plug Valves are ruggedly constructed to provide years of trouble-free operation with minimal maintenance. The Shop Order (SO) Number, Figure Number, size and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

VALVE CONSTRUCTION
The standard materials for plug valves include ductile iron for the body and cover, 95% pure nickel body seat, rubber-coated ductile iron plug, and permanently lubricated 316 stainless steel shaft bearings. Refer to the List of Materials submitted for the order if non-standard materials were provided.

DESCRIPTION OF OPERATION
The GA ECO-Centric Plug Valve can be operated in multiple ways. The 3"- 24" Gear Operated with Handwheel or 2" Nut with Adjustable Shaft Packing can be supplied with ANSI Class 125/150 flanged ends with gear operator and handwheel or 2" operating nut for exposed installations or MJ ends with gear operator and 2" nut for buried service. The 3" to 8" Direct Nut for Lever Operation with Adjustable Shaft Packing can be supplied with ANSI Class 125/150 flanged ends for exposed installations. Plug valves are designed with eccentric rubber disc seating surfaces. The plug rotates 14 turn to provide shutoff in pipes. Tighter shutoff is provided by the eccentric seating action as the actuator is adjusted to provide for more rotation. The valve can be adjusted to a maximum of 10 degrees over travel. Pipeline flow can be regulated by positioning the plug between 15 and 90 degrees open.

CAUTION
Do not force the handwheel, chainwheel, or nut against the stops. This may damage the actuator and will not provide tighter shutoff of the valve. Only actuator adjustments will affect valve shutoff.

CAUTION
Limit switches and/or physical stops must be set properly in order to avoid damage to the motor and/or actuator.

ADJUSTABLE PACKING FEATURE
The packing is already factory set for use. Over the course of continuous operation, it may be necessary to adjust the packing due to leaking from the stem area. Slight quarter-turn increments made to the packing gland fasteners will tighten the packing in a fine-tuning manner. Only a few quarter turns should suffice for most packing adjustments. If necessary, continue to tighten the packing until the leak subsides. If the unit continues to leak after further adjustment, a new set of packing may be required.

RECEIVING AND STORAGE
Inspect valves on receipt for damage during shipment and conformance with quantity and description in the order. Carefully unload all valves to the ground without dropping. On smaller valves, do not lift valves with slings or

chain around operating shaft, actuator, or through water-way. Instead, lift smaller valves with eyebolts or rods through flange holes. Whenever practical, store valves indoors. If not possible, protect valves and actuators from weather and accumulation of water, dirt and debris. Do not expose rubber seats to sunlight or ozone for any extended period. Valves should be stored with the valve disc or closure member slightly open. Make sure flange faces and joint sealing surfaces, body seats and disc seats are clean. Check bolts attaching actuator to valve for loosening in transit and handling. If loose, tighten firmly. Operate valve to make sure it opens and closes properly and that stops and/or limit switches are correctly. Close valve before installing

INSTALLATION

Always take note of the seat end when installing plug valves. Letters are cast into the flange on the seat end of the valve reading “Seat End”. Usually, the valves are installed with the highest pressure applied from the opposite end from the seat. This will assist with pushing the plug into the seat. Always put the seat end towards the pump on pump discharge installations. In cases where shutoff is required in both directions, install the valve so that the highest differential pressure at shutoff is opposite the seat end. For applications where suspended solids are likely to build up in the valve body, the valve be installed with the fluid entering the seat end first. The valve can be installed with the plug horizontal and rotating upward into the top portion of the valve body cavity to open, in extreme cases. Class 125 flanged end valves have ANSI B16.1 flat faced 125/150 flanges. Standard ANSI B16.21 flanges and gaskets should be used to install the valves in the pipeline. If a backing nut is not possible, some sizes utilize tapped holes in the top and bottom of the flanges. Always cycle the valves open and closed several times to ensure they are in good working order prior to installation, to ensure that they have not been damaged during shipment or storage.

OPERATION

(Wrench operated torque collar plug valves, 3-8” only)

Wrench operated eccentric plug valves are closed by turning the valve 90 degrees clockwise. The torque collar on these valves serves the following different functions.

1. Open Memory Stop: Tightening the torque collar adjustment after the correct flow is achieved allows the plug to be set.

2. Closed Memory Stop: The closed stop is pre-set at the factory and only requires readjustment in the event of wear or leakage through the valve when closed. In the event of leakage through a closed valve or excessive wear to either the plug or the seat, the plug can be regulated by simply adjusting the closed stop. If this fails to stop the flow, repeat the procedure until the flow stops and then re-set the lock nut on the closed memory stop to prevent the position from being altered.

OPERATION

(Gear operated plug valves with handwheel or square nut)

Gear operated eccentric valves are closed by turning the gear input shaft in a clockwise direction until the plug is closed. Please see drawings that are specific to each valve for the exact number of turns needed to close the plug.

1. Closed Memory Stop: The closed stop is pre-set at the factory and only requires readjustment in the event of wear or leakage through the valve when closed.

2. Open Memory Stop: The open memory stop is fixed and is non-adjustable. In the event of leakage through a closed valve or excessive wear to either the plug or the seat, the plug can be adjusted by simply adjusting the closed stop. If this fails to stop the flow, repeat the procedure until the flow stops and then re-set the lock nut on the closed memory stop to prevent the position from being altered.

OPERATION

(Actuated plug valves)

Described below are the operating instructions for an eccentric plug valve equipped with an electric motor actuator. General arrangement drawings are provided in conjunction with this manual to illustrate the fitting and installation of the valve and wiring of the motor. Specific wiring details are contained in the electric motor actuator manual. As with any plug valve, the actuator will cause the valve to rotate through VA turn to open or close the valve. The output motion of the actuator is limited by mechanical stops in the gearing. These are

factory set and should not need adjustment. The actual positioning of the valve plug will be done by limit switches in the motor actuator. The switches are also set at the factory, but adjustment is sometimes required if the motor unit is installed on a separate mounting base or floor stand. Detailed procedures are given in the motor manual if adjustment is needed for the mechanical stops or the limit switches. The wiring and power requirements are noted on the wiring diagrams included with this instruction manual.

A gear box and double acting cylinder are used to power hydraulically operated valves. The gear box converts the linear stroke of the cylinder into VA turns. Hydraulic power to the cylinder is directed by auxiliary controls. The auxiliary controls are also used to control the operating speed of the cylinder. A gear box and double acting cylinder are used to power hydraulically operated valves. The gear box converts the linear stroke of the cylinder into VA turns. Hydraulic power to the cylinder is directed by auxiliary controls. The auxiliary controls are also used to control the operating speed of the cylinder.

PREVENTIVE MAINTENANCE

The eccentric valve is designed and manufactured to be long life valve under normal circumstances. It does not require any routine maintenance. Cycling the valve from fully open to fully closed on an annual basis will increase the life of the valve and operator components. However, if maintenance is required due to unusual wear or service conditions, the following procedure should be followed.

TROUBLESHOOTING

Wrench Operated Plug Valves

Problem	Possible Cause	Corrective Action
Valve will not open or close.	Broken or misadjusted torque collar Obstruction in line Excessive line pressure Elastomer damage	Adjust or replace torque collar Remove obstruction Reduce pressure Replace plug
Valve will not shut off flow.	Improper stop adjustment Obstruction in line Excessive line pressure Elastomer damage	Adjust close stop Remove obstruction Reduce pressure Replace plug
Valve leaks at plug stem.	Damaged packing rings	Replace packing rings

Actuated Plug Valves

Problem	Possible Cause	Corrective Action
Valve will not open or close.	No power source Improper signal Burned out or impaired	Check incoming power and/ or replace fuses Check actuating signal sequence Check, replace or replace actuator controls
Valve will not shut off flow.	Improperly set limit switch	Re-set limit switch

Gear Operated Plug Valves

Problem	Possible Cause	Corrective Action
Valve will not open or close.	Obstruction in line Excessive line pressure Elastomer damage	Remove obstruction Reduce pressure Replace plug
Valve will not shut off flow.	Improper stop adjustment Obstruction in line Excessive line pressure Elastomer damage	Adjust close stop Remove obstruction Reduce pressure Replace plug
Valve leaks at plug stem.	Damaged packing rings	Replace packing rings

DISASSEMBLY

1. Loosen the two packing fasteners completely and raise the packing as much as possible, exposing the top of the two packing rings.

2. Grasp and raise the worn packing rings one at a time. With a cutting tool, cut the circular packing rings so that they can be removed.

NOTE: Follow the safety procedures and take caution not to harm or damage the unit.

3. Depending on the size, replacement packing rings may be precut for installation in packing box. Replace each packing ring with cuts positioned 180° apart.

4. Once the packing rings are in place, lower the packing gland until in contacts the packing rings.

5. Put the fasteners back into place and tighten so that the packing gland is applying subtle pressure to the top surface of the packing.

6. Once the gland and packing are in contact, tighten the fasteners using quarter-turn adjustments until visible leakage stops. Use caution in adjusting so as not to over-tighten or damage the packing ring.

REPLACEMENT PARTS
Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail:quotes-ga@vag-group.com

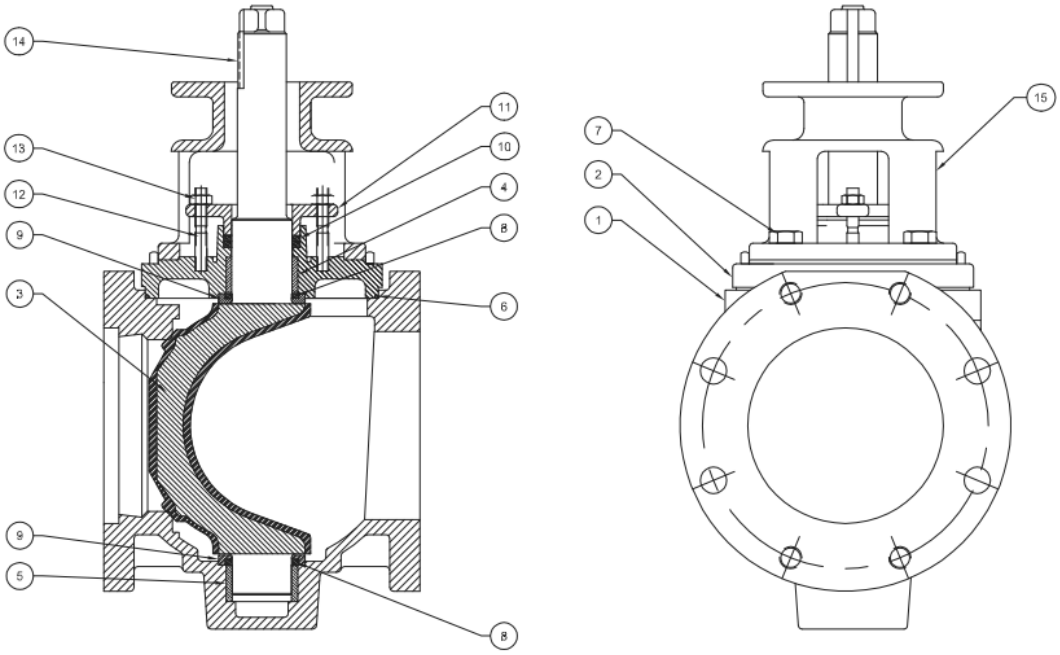
Please have the nameplate data available when ordering parts.

Repair Kits - Figure 517 Plug Valves

Size	Kit Name	Item Number
3"	PLU3	2-80-13000-010
4"	PLU4	2-80-13000-011
6"	PLU6	2-80-13000-012
8"	PLU8	2-80-13000-013
10"	PLU10	2-80-13000-003
12"	PLU12	2-80-13000-004
14"	PLU14	2-80-13000-005
16"	PLU16	2-80-13000-006
18"	PLU18	2-80-13000-007
20"	PLU20	2-80-13000-008
24"	PLU24	2-80-13000-009

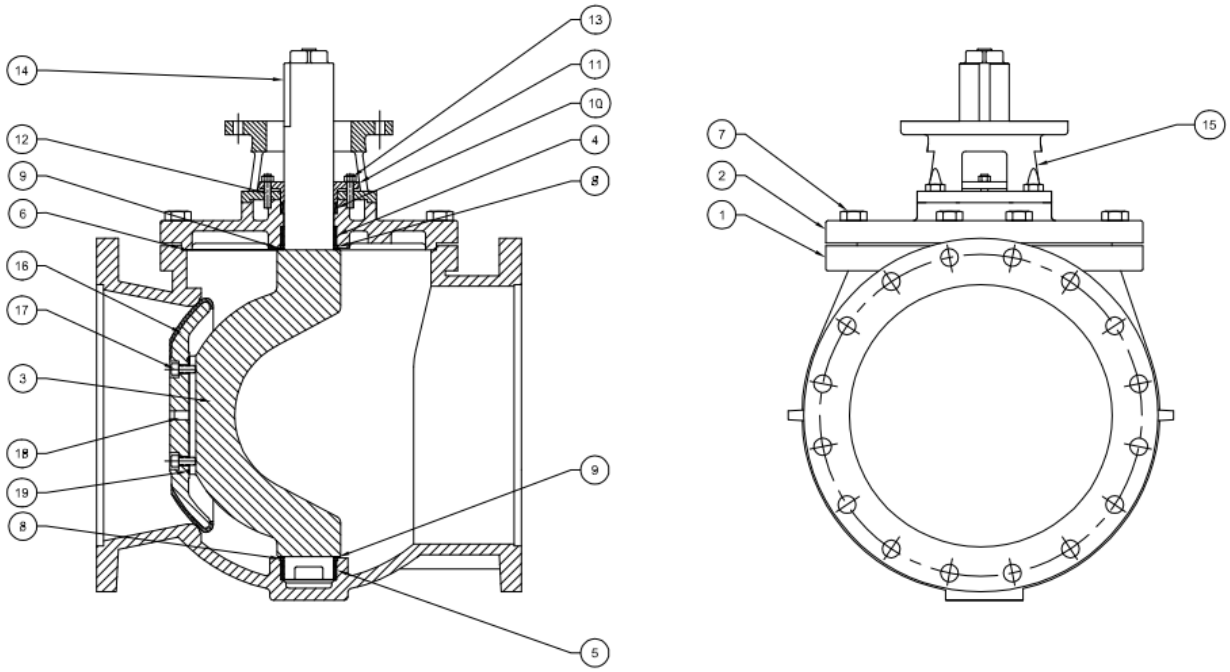
Plug valve repair kits include: Cover O-ring #6, Grit Excluder Seal #8, & (2) Packing #10

PARTS LISTS - FIGURE 517, 3” to 12”



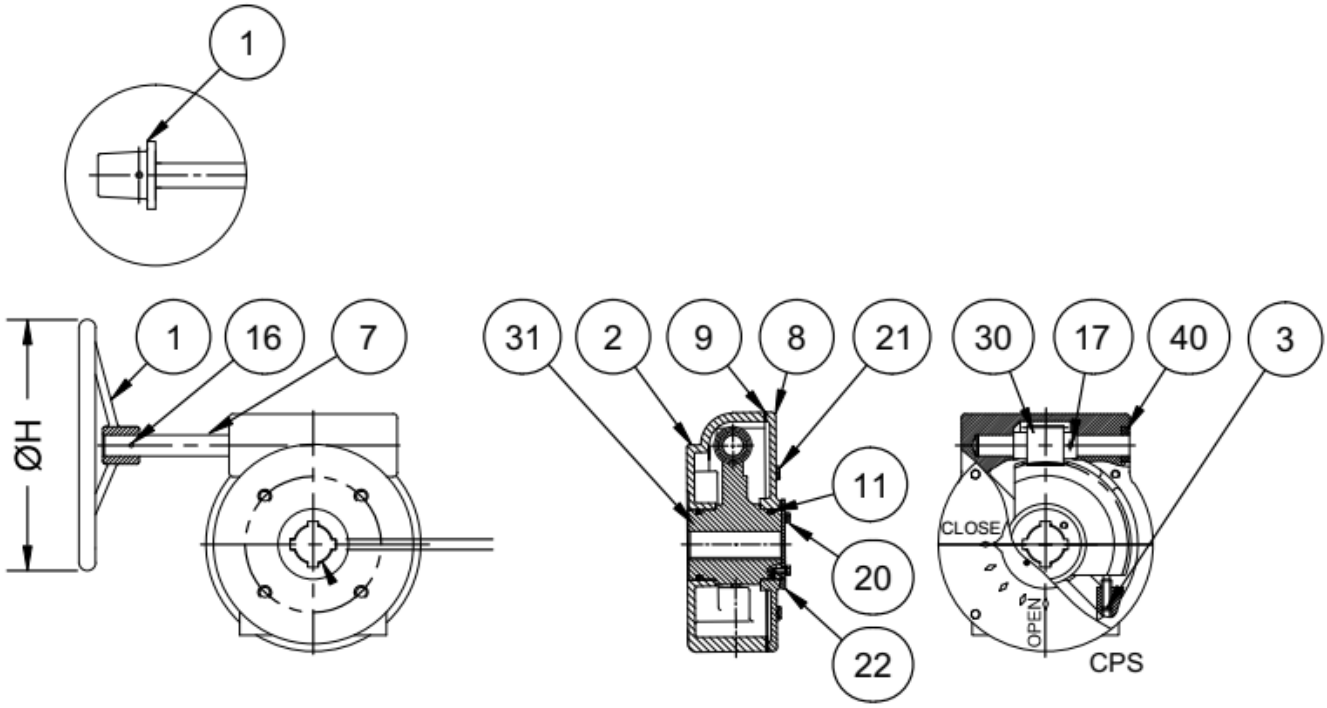
Number	Part Name	Number	Part Name
1	Body	9	Thrust bearing
2	Cover	10	Packing
3	Plug	11	Gland
4	Cover bearing	12	Gland studs
5	Body bearing	13	Gland nuts
6	Cover O-ring	14	Key
7	Cover bolts	15	Mounting bracket
8	Grit excluder seal		

PARTS LISTS - FIGURE 517, 14” to 24”



Number	Part Name	Number	Part Name
1	Body	11	Gland
2	Cover	12	Gland stands
3	Plug	13	Gland nuts
4	Cover bearing	14	Key
5	Body bearing	15	Mounting bracket
6	Cover O-ring	16	Plug
7	Cover bolts	17	Plug screws
8	Grit excluder seal	18	Plug pin
9	Thrust washer	19	Plug O-ring
10	Packing		

PARTS LISTS - Worm Gear Actuator, 3” to 12”

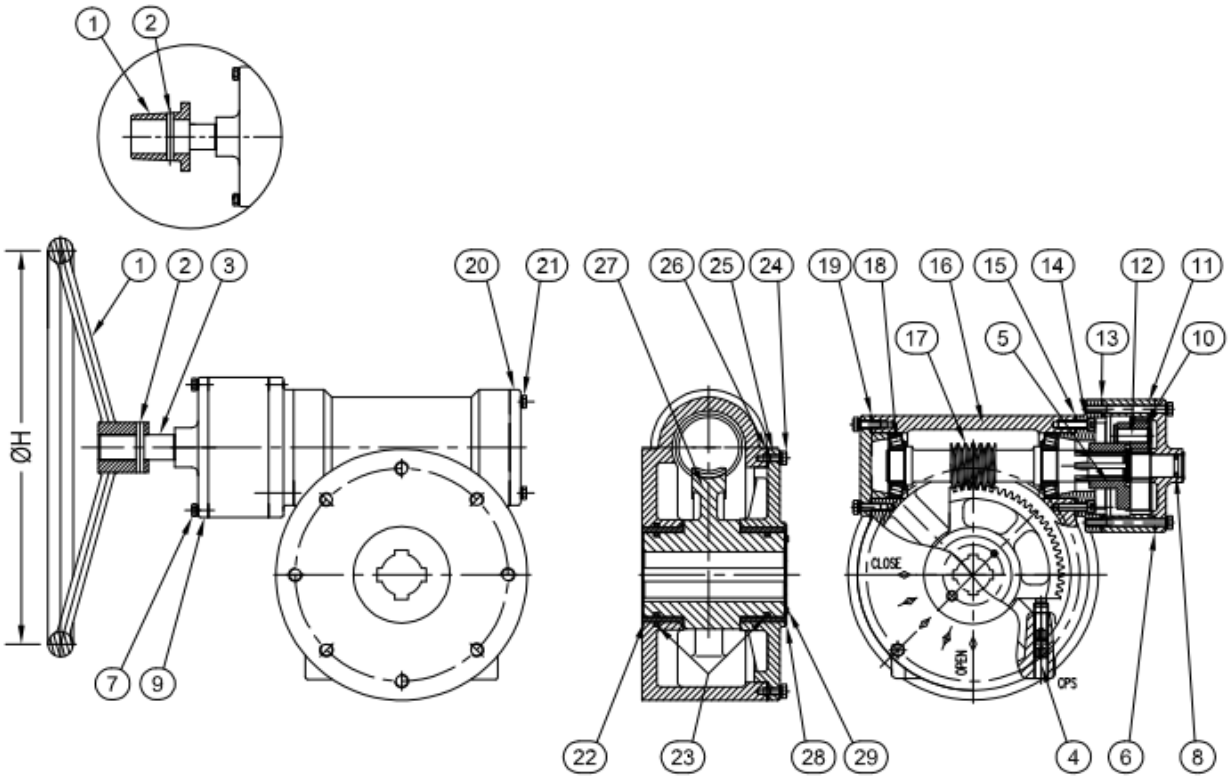


Number	Part Name	Number	Part Name
1	Handwheel or nut	17	Worm pin
2	Housing	20	Indicator bolt
3	Stop screw	21	Cover bolt
7	Shaft	22	Indicating disc
8	Cover	30	Threaded worm
9	Gasket	31	Worm gear
11	O-ring	40	Shaft seal ring
16	Handwheel pin		

NOTES:
1. CPS - Close Position Stop
2. Conforms to AWWA C504 (Can withstand 300 ft-lbs. (407Nm) input torque against stops).
3. Sealed and 90% grease packed.
4. Optional square nut for buried service.
5. Part numbers 20 and 22 are not provided with buried service actuators.
6. Chain wheel per customer request.

Size	Rate input torque (ft-lbs)	Rate output torque (ft - lbs)	Handwheel diameter (ØH)
3”	89	517	12”
4”	89	886	12”
6”	89	886	12”
8”	111	1476	12”
10”	111	1476	12”
12”	111	1476	12”

PARTS LISTS - Worm Gear Actuator, 14” to 24”



Number	Part Name	Number	Part Name	Number	Part Name
1	Handwheel or nut	11	Pinion housing	21	Housing cover bolt
2	Handwheel or nut pin	12	Inner gear ring	22	Bearing
3	Shaft	13	Connecting cover gasket	23	O-ring
4	Stop screw	14	Connecting cover	24	End cover bolt
5	Pinion cage	15	Housing gasket	25	End cover
6	Stem cover gasket	16	Housing	26	End cover gasket
7	Stem cover bolt	17	Threaded worm	27	Worm gear
8	Stem o-ring	18	Thrust bearing	28	Indicating disc
9	Stem cover	19	Housing cover gasket	29	Indicator bolt
10	Pinion gear	20	Housing cover		

Size	Rate input torque (ft-lbs)	Rate output torque (ft - lbs)	Handwheel diameter (ØH)
14”	111	5167	15.75”
16”	111	5167	15.75”
18”	111	5167	15.75”
20”	111	5167	19.69”
24”	111	5167	19.69”

NOTES:
1. CPS - Close Position Stop
2. Conforms to AWWA C504 (Can withstand 300 ft-lbs. (407Nm) input torque against stops).
3. Sealed and 90% grease packed.
4. Optional square nut for buried service.
5. Part numbers 28 and 29 are not provided with buried service acuators.

Acuator Cross Reference Chart

Size	Hand wheel model number	Square nut model number	Item Number (above ground)	Item Number (buried service)
3”	WHP-AG-30	WNP-BS-30	1-80-13000-148	1-80-13000-149
4”	WHP-AG-50	WNP-BS-50	1-80-13000-150	1-80-13000-151
6”	WHP-AG-50	WNP-BS-50	1-80-13000-150	1-80-13000-151
8”	WHP-AG-80	WNP-BS-80	1-80-13000-152	1-80-13000-153
10”	WHP-AG-80	WNP-BS-80	1-80-13000-144	1-80-13000-145
12”	WHP-AG-80	WNP-BS-80	1-80-13000-144	1-80-13000-145
14”	WHP-AG-320	WNP-BS-320	1-80-13000-146	1-80-13000-147
16”	WHP-AG-320	WNP-BS-320	1-80-13000-146	1-80-13000-147
18”	WHP-AG-320	WNP-BS-320	1-80-13000-146	1-80-13000-147
20”	WHP-AG-320	WNP-BS-320	1-80-13000-146	1-80-13000-147
24”	WHP-AG-320	WNP-BS-320	1-80-13000-146	1-80-13000-147

WARRANTY

For a period of one year from the date of shipment, and provided payments for the Products have been made by Buyer to Seller, Seller warrants to Buyer that its Products: (i) substantially conform to Seller's published specifications and (ii) are free from defects in material or workmanship. Specific products may have a warranty period greater than one year. Any Services provided by Seller are warranted to be performed in a good and workmanlike manner. Should a warranted Product or any Services fail to conform to these warranties, Buyer must promptly notify Seller in writing. Seller will, at its discretion and at no charge to the Buyer: (i) repair the Product or Services; (ii) replace the Product or any Services; or (iii) offer a full refund of that portion of the purchase price allocable to the non-conforming Product or Services. Warranty repair or replacement by Seller shall not extend or renew the applicable warranty period. Buyer shall obtain Seller's agreement on the specifications of any tests it plans to conduct to determine whether a non-conformance exists. Buyer shall bear the costs of access for Seller's remedial warranty efforts (including removal and replacement of systems, structures or other parts of Buyer's facility), de-installation, decontamination and re-installation. THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. This warranty allocates the risks of Product failure between Seller and Buyer. This allocation is recognized by both parties and is reflected in the price of the goods. Buyer acknowledges that it has read VAG USA, LLC's Terms and Conditions of Sale, understands it, and agrees to and is bound by its terms.

WHAT IS NOT COVERED BY WARRANTY

No representative of Seller has authority to waive, alter, vary or add to the terms hereof without prior written approval of an officer of Seller. Seller's warranty does not apply to: (i) dynamic vibrations imposed by the drive system in which such Products are installed unless the nature of such vibrations has been defined and accepted in writing by Company as a condition of operation; (ii) improper or unauthorized repair, installation or maintenance of the Products by a party other than Seller; (iii) use for purposes other than those for which designed, or other abuse, negligence, misuse, or normal wear and tear; (iv) unauthorized attachments, modifications or disassembly; (v) damage during shipping; or (vi) Products purchased from unauthorized distributors, resellers or internet sites. Buyer's care in selection, adequate testing at time of installation and proper installation, operation and maintenance of all Products is required for adequate performance.

LIMITATIONS OF LIABILITY

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