

GG50 Gasguard Nozzle – Recommended Maintenance & Repair Procedures

9th August, 2007.

GG50 SERIES GASGUARD NOZZLE.

RECOMMENDED MAINTENANCE AND REPAIR & TESTING PROCEDURES.

OVERVIEW

The following statements on the maintenance and repair of the Gasguard GG50 Series L.P.Gas Nozzle are designed to offer L.G. Equipment's (LGE) authorised international Distributors, O.E.M's & Service Centres recommended methods to bring back into serviceable condition Nozzles which require maintenance or repair.

LGE's recommendations are based on over twenty years of experience in the manufacture, assembly and testing, and repair of such Nozzles. **Whilst LGE's recommended procedures, as set out below, allow for proper repair and maintenance to be carried out on Nozzles, LGE cannot be held responsible for performance of repaired Nozzles.**

LGE has available a **GG53 SEAL KIT** for the GG50 Nozzle Series. It contains seal components and wear items for proper service of the GG50 Nozzle. Other components that are worn or damaged should be replaced on a needs basis. Refer to the assembly drawing for component detail and part numbers.

Age, wear and abuse of the product can render repair inappropriate, and it may be considered more economic to replace full Assemblies or even scrap the Nozzle where service inspection clearly indicates such action is required.

NOZZLE INSPECTION: It is recommended that the GasGuard GG50 nozzle be inspected every **6-12 months** after installment for continual safe operation.

THE GASGUARD GG50 SERIES NOZZLE.

The GG50 Series Gasguard Nozzle is available in the following combinations:-

- GG50L – Nozzle with Latch Assembly fitted.
- GG50SL – Nozzle with Strainer and Latch Assembly fitted.

All Gasguard Nozzles are supplied with either a 15mm(1/2"), 20mm.(3/4")N.P.T. or 25mm. (1"B.S.P.G.) internal inlet thread for hose end connection.

The GG50 SL Nozzle Assembly consists of the following Sub-assemblies (Refer Dwg.X1321):-

	(Inlet Swivel Assembly – 1/2" N.P.T.	Part No. LG2 x 15mm. or,
A.	(Inlet Swivel Assembly – 3/4" N.P.T.	Part No. LG2 x 20mm. or,
	(Inlet Swivel Assembly – 1" B.S.P.G..	Part No. LG2 x 25mm,
B.	Nozzle Body Assembly	Part No. 10-1314-715,
C.	Lever/Latch Assembly	Part No. GG5L,
D.	Valve Assembly	Part No. GG54,
E.	Connector Assembly	Part No. GG57,
F.	Strainer (optional).	Part No. LG9

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TOOLS RECOMMENDED FOR SERVICE ON THE GASGUARD NOZZLE.

L.G.E recommends the following tools be available to facilitate repair & maintenance of the Nozzle:-

- Adjusting Spanner (Wrench) – opening to 38mm.(1.50”) across the flats,
- Long nosed Pliers,
- Light ball-peen Hammer,
- 3.2mm.(1/8”) dia. Drift,
- 7 mm. long shank socket Wrench,
- Screw driver (large blade),
- Bench and Vice,
- 2.5 and 3.0mm. across flats Allen Keys,
- Spring Clamps (medium size – two only),
- 22 mm. Open end Spanner.
- “Pin” Wrench.

ASSEMBLY GREASE RECOMMENDED FOR SERVICE ON THE GASGUARD NOZZLE.

L.G.E recommends and uses the following greases for general coating and/or lubrication of moving parts and threads in the assembly of the Gasguard Nozzle:-

- Aeroshell 22 (Grease) or equivalent for use on all threads – and
- Dow Corning Molycote FS3451 fluorosilicone grease (Molycote) for use on all dynamic O-Ring, U-cup seals –

L.G.E particularly recommends the use of the above greases where ambient temperatures can reach to –55 degrees Celcius. They provide satisfactory properties up to +80 degrees Celcius.

Aeroshell 22 Grease should be applied sparingly by a small brush. It should be used to lubricate all threads and close fitting parts prior to their assembly to mating components and/or assemblies.

Molycote grease may be used to assist easy fitment of seals: U cup, Back-up ring concave face and O-Ring type before their assembly into their related grooves/recesses, or shoulders. A thin film of Molycote is totally adequate.

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DISASSEMBLY OF GG50 MAJOR SUB-ASSEMBLIES (Refer Dwg. X1321)

1) Connector Assembly (E), Lever Assembly (C)

- Remove the Slide Sleeve Saddle (#11 of Dwg. X1313), by sliding the Saddle over the rear of the Slide Sleeve using screw drivers or similar tools as levers.
- Remove the Lever Pivot Pin (#3 Dwg. X1300), then slide the Connector Assembly from the front of the Nozzle. This will expose the Valve Assembly (D).
- Remove the Lever Assembly from within the Nozzle Body lever guard.

2) Inlet Swivel Assembly (A)

- Remove the Locking Screw (#3) from the Nozzle Body Assembly (Dwg. X1314). Fit the Inlet Swivel flats of the Internal Swivel Body (#1 on Dwg. X0777) in a vice, and rotate the Nozzle Body anti-clockwise using a suitable spanner or adjustable wrench. The Inlet Swivel Assembly is removed and held for repair in Section A below.

3) Valve (D), Body (B), Strainer Assembly (F)

Fit the Valve Assembly (D) into a vice, using its flats to locate and hold the Assembly.

- (a) Rotate the Nozzle Body in a counter clockwise direction and separate Valve Assembly from the Body Assembly (B).
- (b) Remove the Strainer (F) (if fitted) by hand.

At this stage there will be six (6) Assemblies ready for individual inspection and service.

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DISASSEMBLY & MAINTENANCE OF SUB-ASSEMBLIES

A. LG2 Inlet Swivel Assembly – Dwg. No. X0777.

Disassemble

- Holding the Inlet Swivel Assembly with the Ball Race Plug (#9) on the underside, give the Swivel a sharp tap on a hard surface to dislodge the Ball Plug. Having removed the Ball Plug, place the Internal Swivel Body (# 1) flats between a vice. Remove the Ball Bearings (#3) by counter-rotation and if necessary apply solvent to remove grease. Pull apart the Internal Body (#1) and External Swivel Bodies (# 2a,b & c).
- Remove and discard all Seals and Back-up rings. Please note that the LG2 x 25mm. Assembly is supplied with a pipe O ring seal, which fits in the internal groove of the External Swivel Body (#2c) before screw connecting the GG50 Nozzle to its dispenser hose connection. This O ring is not supplied in the GG53 kit.

Inspect

- Clean all parts in mild solvent and dry. Check the swivel section of both Swivel Bodies for clean, mark-free surfaces. Wear in the bearing grooves and for unbroken plating.

Assembly

- Assemble one of the two (2) Main Seal O Rings (#6) to the centre internal shoulder of the Internal Swivel Body (#1). Assemble the concave surface of the Back-up Ring (#7) to the forward surface of this O ring. Fit the second O ring (#6) to the front O ring internal groove of the Internal Swivel Body.
- Assemble the O ring Dust Seal (#8) to the rear shoulder of the External Swivel Body (#2).
- Apply Aeroshell Grease to mating surfaces and with an easy twisting and forward thrusting motion, insert the External Swivel Body (#2) to the Internal Swivel Body (#1).
- Place this Assembly in a vice, with the Ball Race groove hole facing upward. Assemble the first of the 13 only Ball Bearings (#3) through this hole using a slight axial pressure between the two Swivel Bodies. Rotate the External Swivel Body to facilitate the Ball Bearing entry and thereafter the remaining 12 Balls can be inserted during a slow rotation of the External Swivel Body.
- Fit the Ball Race Plug (#9) to the hole with its extraction hole facing outward. A little grease in the ball plug hole will prevent the Plug from falling out when handling this Inlet Swivel Assembly.
- The Inlet Swivel Assembly is complete and ready for re-assembly to the Nozzle Body Assembly.

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B) Nozzle Body Assembly -- refer Dwg. No. X1314.

- This Assembly requires little or no maintenance, excepting close inspection to ensure all threads are in good condition for assembly of the Inlet Swivel Assembly and Valve Assembly. Cleaning and thread greasing is normally sufficient for this Assembly. Ensure that the Nozzle Body is not distorted and the Comfigrip (#2) and Lever Latch Pin (#4) are correctly fitted. If being replaced, the pin should be ground flush with the pin supports on the body.

C) GG5L Lever/Latch Assembly – refer Dwg. No. X1300.

This Assembly is normally in a satisfactory condition to be reused in a maintenance programme. If damaged or worn replace the Lever.

- Check the Slippers (#2) for excessive wear on their faces to the Nozzle Body. If there is wear, replace the Slippers – 2 off.
- If a Latch (#4) is fitted, check that its Latch Spring (#6) operates freely with the Latch. Ensure that the Latch has not been damaged or badly worn at the Latch Pivot Pin or contact point with Body Latch Pin. If damage or wear is evident then replace the complete Lever Assembly.

D) GG54 Valve Assembly – refer Dwg. No. X1311.

Disassembly of Valve

- Remove Circlip (#8), followed by the Valve Spring Guide (#7) and Ball Valve/Spring Assembly (#6).
- Holding this Valve Assembly in a vice by its spanner flats, unscrew and remove the U-cup Housing (#2) by the use of a “pin” wrench, using the holes in the front face of the U-cup Housing. Discard the U-cup Seal (#5), Valve Seat (#3) and U-cup Housing O ring (#4).

Inspection

- Check the condition of the face of the Ball Valve, and if scored or damaged, replace the Ball Valve & Spring Assembly (#6). Check and clean all other components. Ensure the U-cup Seal groove in the housing (#2) is clean and smooth.
- Valve Seat, U-cup Housing O ring, U-cup Seal and Valve Body O ring are available from the **GG53 Seal Kit**. These should all be replaced at each service. Other items will only be replaced if worn or damaged.

Assembly

- Assemble U-cup Seal (#5), to U-cup Seal Housing (#2). Fit the Valve Seat (#3) and then Housing O ring (#4) using a dab of grease to hold seat in place.
- Lightly grease the thread of the cleaned Valve Body (#1). Fully screw this assembled U-cup Seal Housing using a “pin” wrench. The U-cup Housing should be flush with the top of the Valve body for correct Valve seat compression. Over tightening could damage the Valve seat and reduce flow rate of assembled nozzle.

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- Invert the Valve body and place Ball Valve & Spring Assembly (#6) centrally onto Valve Seat (#3). Fit Valve Spring Guide (#7) onto the Spring. Press the Valve Guide to expose the groove and fit the Circlip (#8). Ensure Circlip (#8) is correctly fitted and secure in the groove. Check spring action.
- Fit Valve /Nozzle Body O ring (#9) into its groove behind the external thread of the Valve Body (#1).
- The GG54 Valve Assembly is now ready to be assembled into the GG50 Nozzle Body Assembly

E) GG57 Connector Assembly – refer Dwg. No. X1313.

Disassembly

- Remove Circlip (#5) from its groove located in the rear inside diameter of the Outer Sleeve(#2). Align one of the Circlip ends over the extraction hole in the Outer Sleeve. Using a thin spike, carefully push the Circlip inwards, and then with a small screw driver lift and hold Circlip while rotating the Sleeve to remove the Circlip.
- The Outer Sleeve (#2) can now be removed from the Slide Sleeve (#1), releasing the Connector Arms (#6) and Connector Spring (#4).
- Remove the Springs (#4) and (#10) and the six Locking balls (#3).
- Remove and discard O ring (#9) and remove Circlip (#8) from the internal bore of the Slide Sleeve (#1). This allows access to the GG56 Dual Nose Assembly (#7).

GG56 Dual Nose Assembly – refer Dwg. No. X1312

- Remove from the GG57 Connector Assembly.
 - i) Remove Circlip (#7d) and disconnect the Dual Nose Tail (#7a) from the Dual Nose Body (#7c).
 - ii) Remove the Nose Seal (#7e) and U Cup Seal (#7b) from the Dual Nose Body (#7c).

Inspection of Nose & Connector

- Clean both Nose Body (#7c) and Nose Tail (#7a) and check for any wear or adverse marks on both items. Replace if damaged or worn.
- Clean the slide Sleeve (#1), Outer Sleeve (#7), Arms (#6) and the Locking Balls.
- Inspect for cracks, distortion of locking ball holes and wear in Slide Sleeve (#1).
- Inspect for wear or damage to ball groove and arm slots of the Outer Sleeve (#2).
- Check for distortion of locking balls.
- If there is excessive wear, replace with new components.

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Assembly of GG56 Dual Nose

- Grease the front, internal Nose Seal recess area of the Nose Body (#7c) with Molycote. Apply the Nose Seal (#7e) to this recess and apply axial pressure to fully seat the Nose Seal in the recess.
- Lightly coat with Molycote the U-Cup Seal (#7b) and fit to the other end of the Nose Body (#7c), ensuring that it is correctly orientated.
- Assemble the Dual Nose Body (#7c) to the Dual Nose Tail (#7a). Apply Molycote to the inside wall of the Tail, carefully twist while pushing the Dual Nose Body and U-cup Seal into the Dual Nose Tail (#7a). Fit Circlip (#7d) into its internal groove in the Dual Nose Tail (#7a). Ensure that the Circlip clicks into the groove and there is free sliding/axial movement between the Tail and Body of approximately 3mm.
- The GG56 Dual Nose Assembly is now ready to be fitted to the GG57 Connector.

Assembly of the GG57 Connector Assembly will continue.

- Fit O ring (#9) to inside groove of slide Sleeve (#1).
- Thinly grease the outside diameter of the GG56 Dual Nose Assembly (#7) with Aeroshell 22. Fit to the Slide Sleeve (#1) and ensure that it slides freely past the O ring (#9) and in the bore of the Slide Sleeve.
- Fit the Circlip (#8) into its groove in the Slide Sleeve (#1) **NOTE: Circlip (#8) restrains the Dual Nose Assembly within the Slide Sleeve. It is imperative that the circlip be firmly sitting in the circlip groove of the Slide sleeve.**
- Lightly grease the Lock-out Ball holes in the Slide Sleeve (#1), and fit the six (6) Balls(#3).
- Loosly place Circlip (#5) over the Slide Sleeve. This will be used later to lock in the Outer Sleeve.
- Fit Connector Spring (#4) onto Slide Sleeve (#1) ensuring that the Spring sits neatly against the external shoulder of the Slide Sleeve. Ensure that squared spring end of the Connector Spring (#4) is fitted to the shoulder within the Outer Sleeve (#2).
- Fit Outer Sleeve (#2) over Slide Sleeve(#1) and spring, ensuring there is free movement of Outer Sleeve over the Slide Sleeve and Lock-out Balls.
- Fit the 4 Connector Arms (#6) into the Outer Sleeve (#2) while pressing and releasing the Outer Sleeve. Ensure that there is free movement of the four Connector Arms when the Outer Sleeve moves over the Slide Sleeve. Check that the Connector Arms rock evenly about their pivot points. The Connector Arms must sit flush with the leading face of the Outer Sleeve when in an unactuated mode.
- Secure the Outer Sleeve by fitting Circlip (#5) into the internal groove of the Outer Sleeve (#2). Press the Slide Sleeve into the Assembly while working the Circlip into position. An end of the Circlip should be within 10mm of the spike hole to allow for easy removal.

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- Fit tapered Spring (#10) into bore of Slide Sleeve with its larger diameter end addressing the internal step of the Slide Sleeve (#1). Push Slide Sleeve into the Assembly to allow retraction of the six balls when fitting the Spring.
- The GG57 Connector Assembly is now ready to be assembled to the Nozzle Body (#B) and Main Valve Assembly (#D).

NOTE: The tapered Spring (#10) will be fitted during final assembly. The Slide Sleeve Saddle (#11) will be fitted after complete nozzle is assembled and tested.

F) LG9 Strainer Assembly – Dwg. No. X0872.

- This Strainer Assembly, if originally fitted, should be cleaned. If there is damage to the mesh or the ring seal, replace with a new strainer.

ASSEMBLY OF THE GG50 GASGUARD NOZZLE – refer to Dwg. No. X1321.

After maintenance of each Sub-assembly of the GG50 Nozzle, reassemble as a full Nozzle.

1) Assemble Inlet Swivel (A) & Body Assembly (B)

- Fit Nozzle Body/Swivel O Ring and Back Up Ring (#5 & #4 of Dwg X0777) into Nozzle Body. Place the Inlet Swivel Assembly (A) in a vice. Apply grease to the external diameters and external thread of the Internal Swivel Body (#1).
- Screw connect the Nozzle Body Assembly (B) to the Inlet Swivel Assembly firmly. Secure with the Locking Screw (#3 of Dwg X0777) to the Nozzle Body with an Allen Key.
- Check the Swivel Assembly rotates relative to the Nozzle Body. This rotational torque may be high initially, but it will loosen up with use.

2) Assemble Valve Assembly (D), Strainer (F) To Body

- Grease thread of Valve Assembly (D).
- Check O ring is fitted and if required, fit the LG9 Strainer (F).
- Holding the Valve Body flats in a vise, screw the Nozzle Body onto the Valve Assembly. Check O ring is fully contained in its groove.

Note: At this stage of assembly, LGE recommend that a hydrostatic pressure test is carried out, to ensure assembly holds pressure without leaking. Refer to Test procedure for more detail.

3) Assemble Connector (E) and Lever (C)

- Take the tapered Spring (#10 – Dwg X1313) and fit smaller end over the Valve Assembly (D) to rest on the shoulder. Grease as required.

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- Fit the Lever Assembly to the Nozzle Body, ensure that Lever is correctly aligned on Body and Body Lever Guard Web. Fit Lever Slippers (#2 - Dwg X1300) to Lever Assembly. Ensure that the orientation of slippers is correct.
- Holding the Body and Lever, slide the Valve Assembly into the connector until the Lever Pivot Pin holes on the Lever and Connector Slide Sleeve, align. The Slide Sleeve must be fully pushed into Outer Sleeve to allow the spring to pass over the Lock Out Balls.
- Fit the Lever Pivot Pin (#3) – Dwg. X1300. Push this Lever Pivot Pin home fully.

Note: The Nozzle should be tested in an appropriate manner to confirm correct operation and performance prior to installation in the field, before fitting the Connector Saddle (#11 – Dwg. X1313) and allowing use of the Nozzle.

G) GG50 Nozzle Test Procedure

- 1) LGE recommends two (2) series of tests be carried out, i) **static** and ii) **dynamic** flow test.
- 2) It is recommended that the Nozzle be flow and pressure tested using LPGas (propane) as the testing medium at the normal flow pressures of 1600-2000 kPa (230-290 p.s.i.) experienced in the field. If LPGas (propane) is not available, a satisfactory substitute testing medium is bottle nitrogen set on its regulator at 1800 kPa.
- 3) With the **static test**, the Nozzle (*Note: Static test may be carried out prior to fitting Lever (C) and Connector (E)*) is connected to the supply hose, essentially fitted with an isolating valve immediately upstream of the hose end connection to the Nozzle. Apply L.P.Gas pressure from the pressure unit at the above stated flow pressures, and slowly open the isolating valve.
- 4) With the Nozzle closed, check gas pressure security at all joints on the Nozzle especially at the Inlet Swivel connection to the Nozzle. Carry out this test by immersing the Nozzle Assembly in a container of detergent loaded water. Whilst checking pressure security, apply a bending moment to the Inlet Swivel of approx. 27Nm (20 foot pounds) whilst rotating the Swivel Assembly slowly.
- 5) To confirm Connector and Lever operation, without allowing gas into the Nozzle, connect the Nozzle Assembly via its Connector Arms to an approved (vehicle) Adaptor, and check that the Nozzle locks firmly onto the Adaptor when the Lever is fully operated. If firm locking takes place, it can be assumed that the Valve of the Nozzle has opened and would allow L.P.Gas to pass through same during normal pump operation.
- 6) Check Lever movement and where fitted that the Latch engages when the Lever is pulled back and allowed to rest open. Disengage the Latch by pulling back on the Lever and releasing to return Lever to the closed position.
- 7) For a **dynamic flow test**, connect the Nozzle to a vehicle connector fitted with a downstream choked outlet, piped away to a receiving tank or safe outlet to atmosphere.
- 8) Allow gas into the Nozzle and check for gas vapour while valve is closed.

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- 9) Activate Lever to allow gas flow. Check for leaks from the Connector sides. On releasing the Lever check that there is a small amount of gas caused to escape to atmosphere.
- 10) At the conclusion of satisfactory static and dynamic tests, close the hose end isolating valve, operate the Lever to depressurise the Nozzle and remove the Nozzle from the supply hose. Fit the available Connector Saddle (#11 on Dwg. No. X1313) to the Slide Sleeve of the Connector Assembly.

IF ALL THE ABOVE PROCEDURES ARE CARRIED OUT WITH CARE AND ATTENTION TO DETAIL, YOUR GASGUARD NOZZLE WILL PROVIDE YOU WITH SATISFACTORY SERVICE. HOWEVER, L.G.E. CANNOT BE HELD RESPONSIBLE FOR ANY INCIDENT, ACCIDENT OR OTHER SITUATIONS WHICH MIGHT OCCUR WHEN FOLLOWING THE ABOVE REPAIR AND MAINTENANCE PROCEDURES.

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