



The Inspection & Maintenance of Gas Control Equipment

Notes Pack

Name:.....

Date:.....



ANNUAL * MAINTENANCE & INSPECTION PROCEDURES

Note:

1. Ensure that correct PPE is worn
2. Check the cylinder valve outlet to ensure that it is clean, undamaged and not leaking.
3. Ensure that an approved [oxygen safe] leak detection solution (e.g. part no. 99-130) is used.
4. *At least annual – frequency to be determined by operating conditions

VISUAL INSPECTION – REGULATORS

1. Check the regulator for date of manufacture/supply (refer to coding on the rear of the regulator if necessary) – the regulator should be less than 5 years old:
2. Ensure that the regulator is correctly labelled with:
 - Name of the service gas
 - Maximum allowable inlet pressure
 - Outlet pressure range
 - Appropriate standard number(s) [BS EN ISO 2503]
 - Manufacturer or supplier name or logo
3. Inspect pressure gauges (de-pressurised) to ensure that there is no sign of zero error or external damage, etc.
4. Confirm the pressure adjustment knob is captive
5. Ensure that pressure gauges are of safety pattern type construction (EN 562, ISO 5171)
6. Inspect the inlet nut, stem [sealing surfaces] are clean and undamaged and that the inlet filter is in place and is not blocked
7. Confirm that the regulator outlet is clean, undamaged and shows no signs of discolouration or contamination
8. Confirm that the regulator is NOT contaminated with any oils, greases or hydrocarbons

9. Confirm that there is no evidence of PTFE tape adhering to the inlet or outlet threads

FUNCTIONAL TESTING – REGULATORS

1. Seat the regulator onto the service gas cylinder and tighten up the inlet connection with the correct spanner and without using excessive force and ensure that the pressure adjustment screw is fully out
2. Slowly open the cylinder valve (to reduce shock) to approx. 1 full-turn – confirm that there is no leakage of gas between the cylinder valve and regulator inlet
3. Check to ensure that there is no gas leakage at stem to body joint
4. Check that inlet [cylinder contents] pressure gauge responds smoothly and then stops
5. Leak test the following:
 - Inlet pressure gauge to body joint
 - Rear bonnet to body joint (on 2-stage regulators)
 - Rear bonnet vent holes (on 2-stage regulators)
 - Accessory H.P. plugged portIf no signs of outboard leakage are found, then:
6. Close the cylinder valve and observe the inlet pressure gauge – it should stay stable; if the pressure drops then an in-board leak has developed.
7. If there is no evidence of in-board leakage, re-open the cylinder valve to one full turn and fit a shut-off valve onto the regulator outlet.
8. Adjust the regulator to 50% of its maximum outlet pressure range (using the outlet shut-off valve as a stop) and ensuring that the gauge indicator responds smoothly and stops.
9. Leak-test the following:
 - Outlet pressure gauge to body joint
 - Outlet pressure relief valve
 - Front bonnet seal
 - Behind the pressure adjustment knob
 - Outlet connector to body joint

10. If no outboard leaks are found, close the cylinder valve and confirm that there is no change in the outlet pressure indicator position; if this starts to rise, the regulator is creeping. Allow ~20 minutes to leave the regulator in this situation in order to confirm that there are no slow leaks.

11. De-pressurise the regulator, remove the 'stop' valve fitted the outlet and make record sheet up-to-date (see below).



GAS PRESSURE REGULATOR MAINTENANCE INSPECTION CHECKLIST

ITEM SERIAL NUMBER:.....

LOCATION/DEPARTMENT:.....

GAS TYPE:..... (SINGLE OR TWO STAGE?) REGULATOR	YES	NO	COMMENTS
1. Date coded & identified to BS EN ISO 2503 (formerly BS 5741, EN 585, BS 7650)			
2. Correctly labelled Max. inlet & outlet pressures, name of gas & supplier			
3. Clean & free from contamination			
4. Correct range of capacity for work in hand			
5. Inlet in good condition			
6. Outlet in good condition			
7. Pressure adjustment screw captive			
8. Pressure adjustment screw turns freely			
9. Inlet pressure steady (inlet pressure gauge appears to be functional)			
10. Outlet pressure steady (outlet pressure gauge appears to be functional)			
11. Outboard gas leaks from regulator			
12. Internal leakage from first to			

second stage			
13. Outlet pressure creep			
14. Safety pattern gauges fitted (e.g. gauges to ISO 5171, EN 562 (formerly BS 6752))			
15. Gauges undamaged with no sign of zero error			
16. Pass / Fail			
17. Checked by	-----	-----
18. Date of inspection	-----	-----

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VISUAL INSPECTION – FLASHBACK ARRESTORS

1. Ensure that the flashback arrestor is less than 5 years old
2. Confirm that the flashback arrestor is correctly labelled:
 - Name of service gas
 - Maximum working pressure (to match or exceed the maximum outlet pressure of the regulator to which it is fitted)
 - Direction of gas flow
 - Standard number (e.g. EN 730)
 - Manufacturer's name or logo
3. Inspect the inlet and outlet connections to confirm that they are clean, undamaged and show no signs of discolouration by heat or sooting

FUNCTIONAL CHECKS – FLASHBACK ARRESTORS

Using the reverse flow adaptor, connect the flashback arrestor (with it's direction of flow arrow pointing towards the regulator) to the pressure regulator.

Ensure that the pressure adjustment knob on the regulator is wound fully out and then slowly open the cylinder valve to one full turn

1. Pressurise the flashback arrestor to ~1 psiG and confirm that no gas is flowing through the arrestor to atmosphere (if this does happen then the non-return valve has failed)

2. Increase the pressure to ~10 psiG and leak test any joints in the flashback arrestor assembly to ensure that there are no leaks to atmosphere
3. If the flashback arrestor is a re-settable type, perform step 2 (above) slowly until the re-set device trips (depending upon the type this may occur at ~10 psiG - ~14 psiG) – record the pressure at which this occurs; if the pressure at which the flashback arrestor trips is < 3 psiG then the unit is ‘tired’ and will cause nuisance tripping
4. Leak test the flashback arrestor for outboard leakage and if no signs of this are found then unit may be de-pressurised and re-fitted. The recording sheet should then be made up-to-date

FLASHBACK ARRESTOR MAINTENANCE / INSPECTION CHECKLIST

SERVICE GAS:	YES	NO	COMMENT
DATE CODED & LESS THAN 5 YEARS OLD			
IDENTIFIED TO A SUITABLE STANDARD (e.g. EN 730)			
INLET AND OUTLET CONNECTIONS CLEAN AND UNDAMAGED			
REVERSE FLOW TEST @ ~1 psiG PASSED?			
REVERSE FLOW TEST TO RE-SET TRIP PASSED? ENTER PRESSURE VALUE IN COMMENTS			
OUTBOARD GAS LEAKS FROM THE FLASHBACK ARRESTOR?			

VISUAL INSPECTION – HOSES

1. Disconnect the hose(s) and lay it out fully, confirm [along the entire length] that the hose is in good order, undamaged (free from surface damage, burns (fire damaged hoses must be replaced), cracks, cuts, etc. Flex the hose to ensure that it does not kink or flatten when a radius is formed
2. For oxy/fuel systems ensure that both hoses are of the same length and nominal bore and that there are no repairs or splices within 3 metres of the outlet end(s) of the hose(s).
3. Confirm that the hose is correctly colour-coded (BLUE for oxygen, RED for acetylene, ORANGE for propane, BLACK for air or inert gases) and labelled with the following:
 - SUITABLE STANDARD (e.g. EN 559)
 - NOMINAL BORE
 - MAXIMUM ALLOWABLE WORKING PRESSURE
 - YEAR OF MANUFACTURE

4. Confirm that the end fittings on the hose are secured using suitable clips (e.g. Oetiker type, ferrules, Band-It, type) – worm drive clips are not acceptable
5. Confirm that hose check valves are fitted to the outlet ends of the hoses

HOSES – FUNCTIONAL CHECKS

1. Connect the hose check valve (outlet end) of the hose to the regulator outlet, ensure that the pressure adjustment knob on the regulator is wound fully out and slowly open the cylinder valve to one full turn
2. Apply ~1 psiG [back] pressure to the hose check valve and prove that this is fully sealed by leak testing at the outlet end of the hose
3. Unwind the pressure adjustment knob on the regulator and de-pressurise hose by disconnecting it from the regulator. The hose may now be re-fitted with hose check valve at the blowpipe end.
4. With the hose connected to the blowpipe, and the blowpipe valves closed, the hose may now be pressurised (to ~30 psiG for oxygen or ~3 psiG for the fuel gas) and leak tested at all joints and connections to ensure that there are no outboard leaks
5. The recording sheet should then be made up-to-date

SERVICE GAS:	YES	NO	COMMENT
HOSE IS CORRECT COLOUR FOR THE SERVICE GAS			
SUITABLE STANDARD (E.G. EN 559)			
HOSE IS FREE FROM SURFACE DAMAGE, CONTAMINATION, CRACKS & BURNS			
INLET AND OUTLET FITTINGS UNDAMAGED AND CLEAN			
INLET AND OUTLET FITTINGS SECURED WITH THE CORRECT CLIPS			
HOSE CHECK VALVE FITTED			
HCV/V STOPPED FLOW ON REVERSE FLOW TEST			
HOSE ASSEMBLY FREE FROM LEAKS			