



Service Hose Testing and Coupling Inspection

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Scope	This Standard Operating Procedure applies to all CFA Brigades.
Definitions	<p>The following definitions apply to this Standard Operating Procedure:</p> <ul style="list-style-type: none">▪ CFA member: A person who is registered by the Authority as a volunteer officer or member of a Brigade and/or a person who is employed by CFA.▪ Competent: The ability to effectively undertake the task required.▪ Coupling: A device that serves to connect the ends of adjacent fire hose.▪ External Lug: Projections on either side of a coupling that secure two couplings together.▪ kPa: Kilopascals.▪ No Go Zone: Exclusion area during a hose test where the pressure of the hose is in excess of 500kPa. A minimum distance of 5m is required either side and around laid out hose(s) except where there is a wall or fixture structure that prevents access to the area. Perimeter marked using witches hats or similar. Personnel to remain outside this area whilst three minute test takes place.▪ Operational activities: CFA approved, coordinated or pre-planned action, or series of actions, in response to and in support of a potential or existing emergency incident, including training and exercises.▪ Operational employee: An employee of the Authority who is an operational staff member (per the Country Fire Authority Regulations 2014).▪ Service hose (Delivery lay flat hose): A soft wall hose that assumes a flattened shape when empty.
Objective	<p>To ensure that activities involving inspecting and testing of service hose and couplings:</p> <ul style="list-style-type: none">▪ Provide for such items to remain in good operational condition at all times;



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Procedure

- Test pressures (set by vehicle pump pressure limitations); and
- Ensure that personnel undertaking service hose testing do not enter the No Go Zone whilst hose is under test pressure.

1. Hose testing shall be conducted by a competent pump operator and at least one (1) other CFA member/operational employee wearing the appropriate PPC/E.

2. Frequency of Testing

- 2.1 All service hose and couplings shall be inspected and tested at least annually.
- 2.2 All service hose shall be tested after it has been used for operational activities.
- 2.3 Testing must be undertaken when defects are suspected.

3. Procedure

- 3.1 The procedures for testing service hose shall be conducted in accordance with AS1851-2012 Maintenance of Fire Protection Systems and Equipment (refer to Schedule 1).
- 3.2 All couplings and hose patches should be inspected prior to testing. External lugs inspected in accordance with Schedule 2.
- 3.3 When testing multiple hose lengths ensure the couplings are configured to be in the centre of the laid out hose.

4. Test Pressures
(set by vehicle pump pressure limitations)

- 4.1 Class 1 and 2 Brigades – test to 1,000 kPa. PPC/E in accordance with Schedule 1.
- 4.2 Class 3, 4 and 5 Brigades – test to 1,400 kPa. PPC/E in accordance with Schedule 1.

5. Administrative Procedures

- 5.1 All hose shall be numbered for ease of identification.
- 5.2 Results of any hose testing shall, as a minimum, be recorded in accordance with Schedule 3.

<p>Safety requirements</p>	<p>To prevent potential injuries occurring during hose testing:</p> <ul style="list-style-type: none"> ▪ Test hose pressure according to Brigade classification. ▪ Wear appropriate PPC during hose testing (as detailed in Schedule 1). ▪ Establish and maintain a No Go Zone during the testing process. ▪ Ensure non-involved personnel are kept away from the testing area. ▪ Ensure Pump Operator uses a delivery which is not located with pump controls. Use a side delivery so operator is not in line with pressurised hose. Pump Operator to remain at pump control panel and maintain a visual overview and enforcement of the No Go Zone. ▪ Ensure that once the hose has been filled with water and bled of air, the delivery valve should be reduced (to 1/4) to limit further flow to the hose being tested. The testing of hose requires pressure rather than flow. The reduction in potential flow by gating the delivery back, will reduce the risk of injury should a failure occur. ▪ All personnel must be outside the No Go Zone whilst the hose is under its three minute maximum working pressure. ▪ If you need to mark or move the hose you need to depressurise and stop the test. Restart the three minute test as required. ▪ All personnel must ensure that the pressure in the test hose is depressurised prior to marking leaks and defects.
<p>Environmental notes</p>	<ul style="list-style-type: none"> ▪ Time annual hose testing to avoid periods where water restrictions may apply. ▪ Be aware of water run off where contaminants may be present in hose lines (e.g. chemicals, coal dust or asbestos).





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Related Documents			Other Links and References	Delegations
Policies	Standing Orders	SOPs		
	Firefighting Equipment Health and Safety	Firefighting Equipment – Testing of	Country Fire Authority Act 1958 Country Fire Authority Regulations 2014 AS1851 Section 8 2012	OIC Brigade Rostered Duty Officer

Date to be Reviewed:	Date to Cease:	Date Endorsed:	Endorsed By:
TBA	N/A		Steve Warrington Chief Officer



Schedule 1 – Hose Testing Procedure

1. PPC/E

Appropriate minimum PPC/E for hose testing is:

- Wildfire PPC/E including helmet, wildfire goggles, overtrousers, gloves and boots (Figure 1); or
- Structural PPC/E including helmet, wildfire goggles, overtrousers, gloves and boots

This level of PPC/E must be worn at all times during the testing procedure.



Figure 1
Wildfire helmet and goggles

2. Testing of Hose

- Select an area to test the hose that will not leave more dirt on the hose. A clean concrete or area of hard standing is suitable (refer Figure 2), however a dry, grassed area or cut paddock may suffice.
- Lay the hose out flat and wash and scrub it clean with a broom or brush.
- Prior to the pressurising of a hose, a visual inspection of the patches and couplings should take place. Attach a shutoff branch.
- Couple the hose to the pump.
- Mark coupling with pen and watch for movement away from the line.
- Deliver water through the hose briefly to ensure all air has passed through the hose.
- Close the branch, then crack the branch to allow minimal water to pass (approx. 1L per minute). This will allow for depressurisation at the conclusion of the test.



- Pressurise the hose for three minutes to 1,000 kPa for Class 1 and 2 Brigades and 1,400 kPa for Class 3, 4 and 5 Brigades.
- Inspect the couplings for leaks outside the No Go Zone.
- Inspect the pressurised hose for holes outside the No Go Zone.
- Mark damage as shown in Item 3 (Schedule 1).

Note: When a patch on a hose passes its initial hose test, it then becomes a component of that hose. As the hose is tested at a minimum annually, if a visual inspection of the patch at this time is included (not whilst under pressure) and in conjunction with the hose test itself, then the patch and hose are compliant until the hose's next required test. Therefore the hose and patch have an operational lifespan until they don't pass a test or for other reasons withdrawn from service.

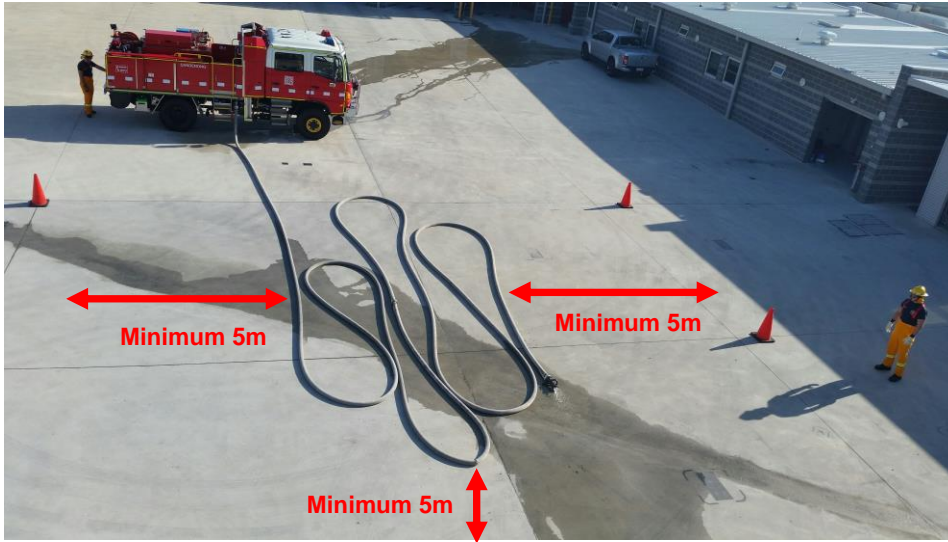


Figure 2 – Pump Operator position when hose testing (Tanker)

3. Marking Damage

Marking damaged hose (refer Figure 3), is best done by applying string, masking tape or electrical tape around the hose before and after the hole. The use of texta, pen or liquid marking tool(s) to indicate damage is a last resort as this may interfere with the bonding process when a patch is applied. Knotting the hose at the end closest to the damage can be a visual indicator that damage has occurred to the hose.



Figure 3 – Suggested Damaged Hose Marking Method

4. Repairing hose



- Remove all water from the hose by using the Brigade's hose drying facilities (e.g. hanging it over a fence or similar structure). Be aware that barbed wire may damage hoses.
- Repair the hose using CFA supplied patching materials or if this is not available return the hose to the District Headquarters for repair.

5. Recording

Schedule 3 depicts minimum recommended hose testing/repair proforma to record the hose test and keep track of hose repairs. This form shall be completed when hose is tested and have it available for the Brigade Inspection.

6. Safety note

Ensure the hose couplings are securely tightened before commencing tests.



Schedule 2 – External Lug Coupling Inspection Checklist

Lugs

Inner washer

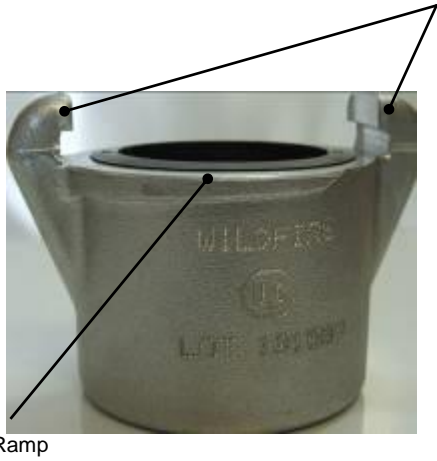


Photo 1



Photo 2

Checklist	Indicators of Fault	Remedial Action
1. Ensure that coupling is correctly attached to hose.	<ul style="list-style-type: none"> Any movement or slippage of hose within coupling. The coupling may appear crooked and not parallel with the hose. 	<ul style="list-style-type: none"> Loose or crooked couplings must be removed and reattached. Do not re-tension the existing expanding (copper or brass) ring as this may alter the clamping force and consequently break the die cast coupling or the tensioning tool.
2. Clean outer surface of coupling, including lugs and mating face, and ensure these are free of external corrosion.	<ul style="list-style-type: none"> Corrosion includes any discolouration (such as white powder deposits) or built up foreign matter. 	<ul style="list-style-type: none"> Corrosion can be removed with a wire brush. Be sure to remove the mating face washer before brushing. Lightly brush the affected area. DO NOT USE A WIRE BRUSH DRILL ATTACHMENT.
3. Ensure outer surface of coupling and lugs are not deformed, excessively worn or cracked.	<ul style="list-style-type: none"> Wear can include any burrs or indentations. 	<ul style="list-style-type: none"> Burrs or indentations may be removed using a fine flat file. LIGHTLY FILE THE AFFECTED AREA.
	<ul style="list-style-type: none"> Deformation includes bent lugs and cracks. 	<ul style="list-style-type: none"> Lugs bent slightly inwards can be restored using a fine flat file to dress the clamping face of the lug. Lugs bent outwards cannot be repaired. Coupling must be removed from service. Cracked couplings must be removed and replaced with a new ULC type coupling. ENSURE THE COUPLING IS DISPOSED OF AND NOT RE-USED.



Checklist	Indicators of Fault	Remedial Action
<p>4. Ensure that the mating face is not deformed, excessively worn or cracked.</p>	<ul style="list-style-type: none"> Burrs affecting operation of coupling or potential handling/cutting hazard. 	<ul style="list-style-type: none"> All burrs to be removed using a fine flat file. LIGHTLY FILE THE AFFECTED AREA.
	<ul style="list-style-type: none"> Excessive wear that affects operation of coupling. 	<ul style="list-style-type: none"> Dispose of coupling
	<ul style="list-style-type: none"> Deformation includes distorted lugs or ramps, cracks and indentations affecting operation of coupling. 	<ul style="list-style-type: none"> Cracked couplings, couplings with indentations affecting coupling operation or couplings with deformed lugs and ramps must be removed and replaced with a new ULC type coupling. ENSURE THE COUPLING IS DISPOSED OF AND NOT RE-USED.
<p>5. Ensure the mating face washer is in good condition, slightly proud of the mating face surface and free of debris.</p>	<ul style="list-style-type: none"> Incorrectly installed mating face washers will appear loose and move. 	<ul style="list-style-type: none"> Adjust washer to fit correctly as in Photos 1 and 2. The washer may provide a better seal if 'flipped' over. However, if the bottom of the rubber washers has raised dots, then these cannot be flipped over and must be discarded. Replace with a new rubber washer.
	<ul style="list-style-type: none"> Dirty mating face washers may bulge and not fit correctly. 	<ul style="list-style-type: none"> Remove washer and wipe clean with a damp cloth. Remove any debris from mating face washer recess and re-fit washer.
	<ul style="list-style-type: none"> Poor mating face washers include brittle, cracked or damaged washers. 	<ul style="list-style-type: none"> Cracked, brittle or damaged mating face washers must be replaced. ENSURE THE WASHER IS DISPOSED OF AND NOT RE-USED.

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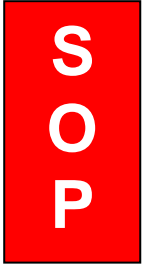
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Checklist	Indicators of Fault	Remedial Action
6. Ensure the inner washer, (where fitted) is in good condition and correctly fitted between the hose and coupling.	<ul style="list-style-type: none"> Poor inner washers include brittle, cracked or damaged washers. 	<ul style="list-style-type: none"> Cracked, brittle or damaged inner washers must be replaced. ENSURE THE WASHER IS DISPOSED OF AND NOT RE-USED.
	<ul style="list-style-type: none"> Incorrectly installed inner washers, (where fitted) may bulge or appear loose. 	<ul style="list-style-type: none"> At a Fire Station location, if washers are found loose and a coupling tool and is available, the coupling must be dismantled from hose and refitted in accordance with FGP 1.10. If washers are loose and in a field situation, then washer must be removed. If washer tight and secured by coupling ring, leave in position.
7. Ensure that lugs turn to between halfway and fully engaged when coupling is hand tightened by testing on at least two other couplings.	<ul style="list-style-type: none"> Coupling just engages. Gap between mating faces is greater than 3mm. 	<ul style="list-style-type: none"> Repeat step 5. In the unlikely event that repeating step 5 does not remedy the problem, the following action is to be taken: <ul style="list-style-type: none"> If DIE CAST coupling involved, then dispose of the coupling If FORGED coupling (with ULC stamp) involved, then contact Engineering Services.
	<ul style="list-style-type: none"> Coupling appears loose when coupled. 	<ul style="list-style-type: none"> Repeat steps 3, 4 and 5. In the unlikely event that repeating steps 3, 4 and 5 does not remedy the problem, the following action is to be taken: <ul style="list-style-type: none"> If DIE CAST coupling involved, then dispose of the coupling If FORGED coupling (with ULC stamp) involved, then contact Engineering Services.

Notes:

Remove couplings by prying copper or brass expanding ring out. Only cut hose if the hose itself is damaged.

Do not paint couplings as paint can hide cracks and damage on the couplings surface.



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