

TECHNICAL BULLETIN

Ref Document No.	TB13002	Issue No.	1
Subject	Exhaust Gas Test Port		
Release Date	21 st October 2013		

Purpose

To advise machine owners of possible leaks from the end of a MSHA approved Exhaust Gas test port.

Applicability

Applies to all COALTRAM® CT08, CT10 and CT13 vehicles.

Background

A report was made to Diversified Mining Services (DMS) noting that a local mine has identified a leak in the end of a MSHA approved Exhaust Gas test port valve.

Investigations/ Findings

The investigation took place in discussions with the mine operators as well as the Mechanical Inspector from the NSW Department of Primary Industries.

The sampled valve was taken by DMS for closer analysis to identify where and how the leak occurred.

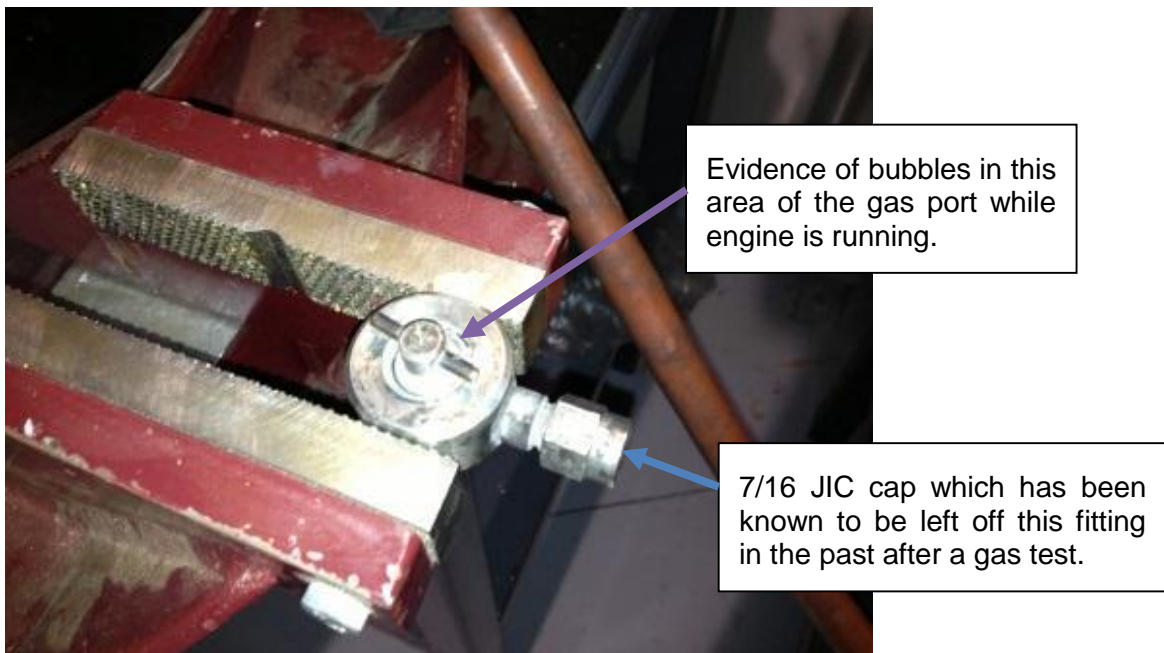
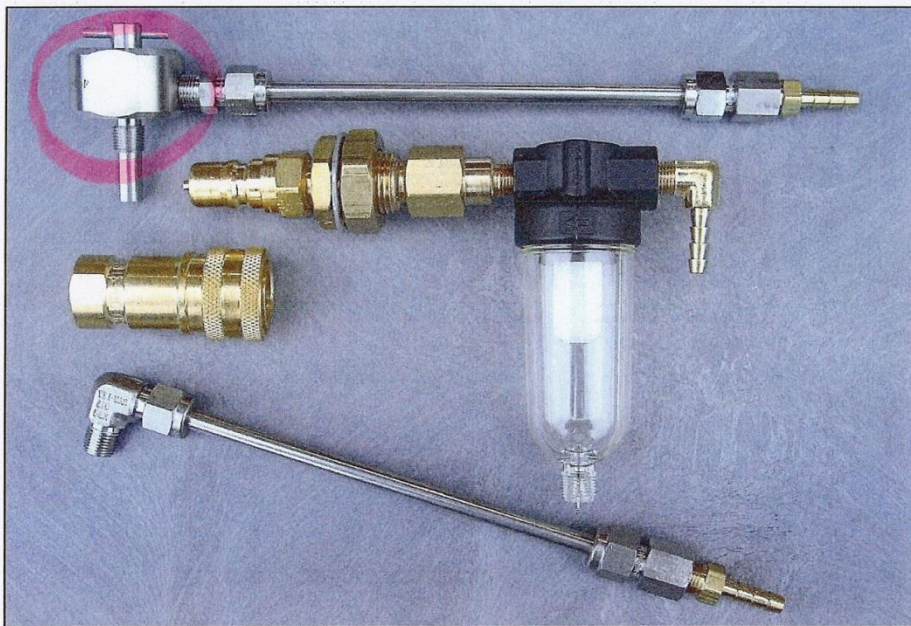


Figure 1: Leaking Valve

The component is classified as an Open Joint under the AS/NZS 3584.2 p 11 and 12. The test port has always been identified as being a MSHA approved component (see attached information) but not under the Australian Standard to meet the criteria of an open joint. The decision was made by DMS that it would be used as an optional component as it provides additional safety to the current design. This decision was based on the original design risk assessment.



**EXHAUST GAS
SAMPLING PORT KITS**



Spec. No. **M59-301-01-INBY**
M59-591-01-OUTBY

Flame-Proof Port

MSHA requires the measure of the total restriction of the intake system and the total exhaust gas backpressure of the exhaust system of every inby approved and outby heavy duty diesel engine power package at scheduled intervals. Because these measurements require that pipe plugs be removed from flame-proof components and that probes be inserted into the open ports while the engine is running, these tests must currently be performed at an outby location of the mine. The plugs, located in the engine compartment, must be removed and re-installed for each test. The mechanic must stand next to the machine, with the engine running at high idle, while the test is performed.

A Flame-proof Port Kit has been developed which simplifies the tests, saves time, and provides a safer condition for the mechanic.

A Flame-proof Port is permanently installed in both the total intake restriction and total exhaust backpressure port. The design of the Flame-proof Port meets all MSHA requirements for flame proof components, and has been tested and certified by MSHA as part of flame-proof intake and exhaust systems. Tests can now be conveniently performed at either an inby or outby location of the mine.

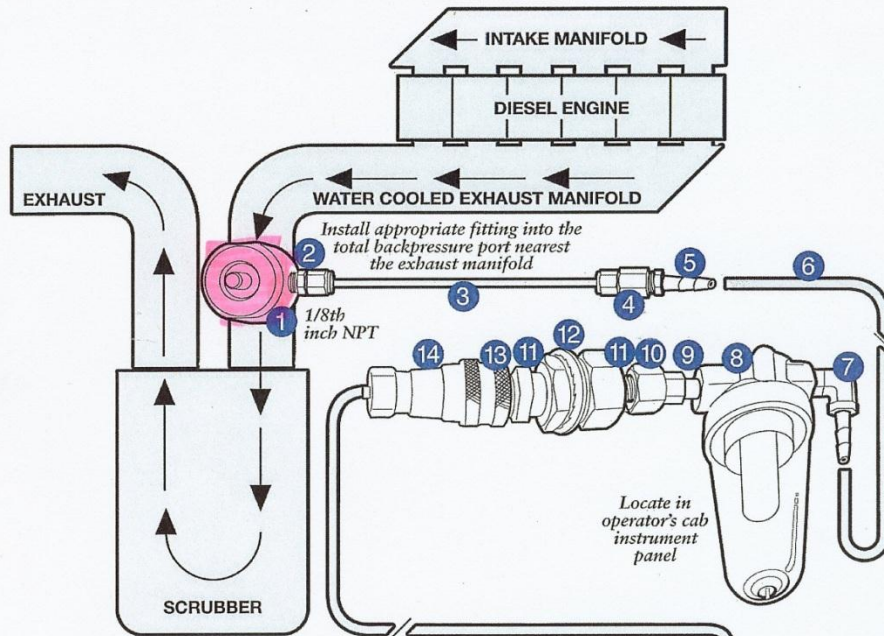
A pipe or hose connection is provided from each Flame-proof Port to the operator's cab, where either a permanently installed gauge or a quick connect gauge may be used to perform the MSHA required measurements. In either case, the mechanic can perform the tests from inside the safe location of the operator's cab.

A requirement of MSHA Part 7 regulations is that untreated, undiluted exhaust gas must be sampled. The sample must be taken while the engine is under full load and the only suitable sampling location is the exhaust backpressure port located in the engine compartment. If fitted with the Flame-proof Port, the required sampling can be performed by adding a condensing tube and a water separator into the line between the Flame-proof Port and the engine compartment and another quick connect port in the operator's cab. A suitable hand held CO monitor is connected to this quick connect port and the sampling is conducted by one mechanic from the safe location of the operator's cab.

For either application, the Flame-proof Port allows the mechanic to perform the required tests quicker and safer, eliminating the need for a second person to operate the engine, and can be performed at any location in the mine.

Schematic Scrubber System
Shown with Optional Flame Proof Port

Spec. No. M59-301-01-INBY
M59-591-01-OUTBY

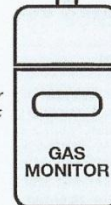


DST PORT KITS

Item	Part No.	Description	M59-301-01 In-by Kit	M59-591-01 Out-by Kit
1	M40-596-01	Flame Proof Port	▲	
2	5182K807	Male Fitting	●	
3	M59-502-11	Cooling Tube	●	●
4	5182K794	Female Fitting	●	●
5	5346K11	Male Barb	●	●
6	5268K11	High Temperature Hose (Specify Length)	▲	▲
7	44555K147	Barbed Elbow	●	●
8	M59-503-11	Water Separator Filter	●	●
9	50785K151	Nipple	●	●
10	50785K181	Coupling	●	●
11	50785K152	Nipple	●	●
12	M59-504-01	Bulkhead Coupling	●	●
13	M59-505-03	Nipple	●	●
14	M59-505-02	Quick Coupler	●	●
15	M91-596-01	Elbow (not illustrated)		●

▲ Not included in kit. Must be ordered separately.
We reserve the right to change specifications without notice. 7/15

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With the addition of the gas test port it adds additional safety as any spark needs to travel along the open joint and has an increased capacity to cool the spark before it enters external atmosphere along the shaft area as seen in Figure 2 below.

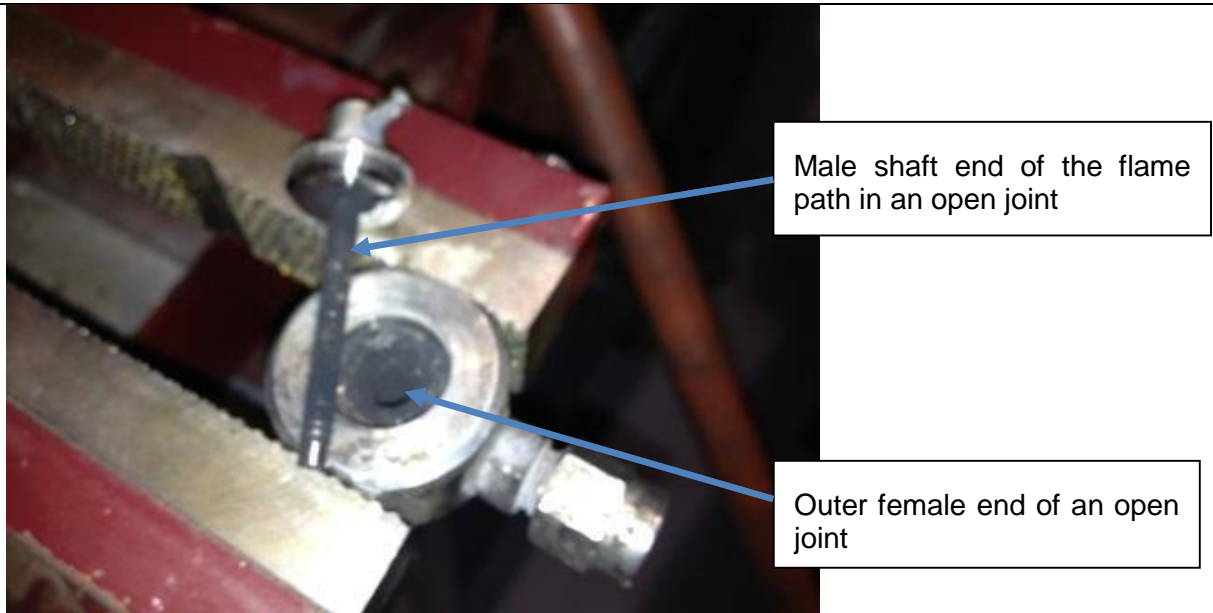


Figure 2: Test Point Internals

The component was never tested as part of the original engine approval and relied on the world wide recognised MSHA approval.

A review of clearance was undertaken to compare the test point with AS/NZS 3584.2: 2008. It was identified that by only having a flame path length of 42 mm the clearance between the spindle and the outer bore according to the standard should have been 0.43mm while the actual measurement was measured at 0.70 mm.

There was also some evidence that the clearances between the inner and the outer parts of the gas test port (the open joint) did not allow enough gas flow to take bag samples while doing a gas test and therefore the whole assembly was being removed, defeating the purpose of the design.

Recommendations

Due to the identified issue with the gas port being removed for gas testing as not enough exhaust gas can be withdrawn between the clearances of the open joint and the non-compliance to meet the AS/NZS 3584.2:2008 it is the OEM's decision to inform the industry that the gas port shall be removed from every vehicle fitted with the unit. A standard 1/8" BSPT to 7/16" JIC male to male nipple with 7/16" JIC Cap is to be fitted in its place.

Brett Neal

Manager – Technical Support & Service Centres