

Technischer Bericht Nr.: 07-7063-00-02
ECE Regelung Nr.: 110
Antragsteller: Hy-Lok Corporation
Typ: CVH2 series check valve

REPORT
No. 07-7063-00-02

regarding the first extension of the existing approval E1 110R 000163

Manufacturer's name and address: Hy-Lok Corporation
1467-1, Songjeong-Dong
Gangseo-Gu, Busan 618-817
South Korea

Trade name or mark: Hy-Lok

Type: CVH2 series check valve

CNG component: Check valve
Class according to R110: 0

Applicable regulation(s): ECE R110 including supplement 9 of 2010-08-19
State of the art

Technical Service: Typprüfstelle Fahrzeuge/Fahrzeugteile, TÜV Rheinland Kraftfahrt
GmbH, Ingenieurzentrum TÜV Saarland automobil GmbH Verkehrs-
technik

Reason for the extension: Creation of a check-valve family by introducing the two versions CVH1
and CVH2. CVH1 is newly added, covering two additional port connec-
tion sizes.

Final statement:

The requirements of the ECE R 110 are met. There are no safety related technical objections. The use of the check valve in CNG driven vehicles is supported.

Saarbrücken, 2011-07-15



Dr.-Ing. Stefan Behrning
Expert Pressure Equipment

Technischer Bericht Nr.: 07-7063-00-02
ECE Regelung Nr.: 110
Antragsteller: Hy-Lok Corporation
Typ: CVH2 series check valve

CONTENTS

1	CONSIDERED SPECIFIC COMPONENT	3
2	CHECK VALVE, TYPE CVH2 SERIES CHECK VALVE	3
2.1	INTENDED USE	3
2.2	DESIGN	3
2.3	MATERIALS.....	3
3	DOCUMENTS TO THE APPROVAL	4
4	APPLICABLE REGULATIONS	4
5	PERFORMED TESTS	4
6	CONCLUSION.....	4

Technischer Bericht Nr.: 07-7063-00-02
ECE Regelung Nr.: 110
Antragsteller: Hy-Lok Corporation
Typ: CVH2 series check valve

1 Considered specific component

With its request dated 2011-07-13 the manufacturer Hy-Lok Corporation, 1467-1, Songjeong-Dong, Gangseo-Gu, Busan 618-817, South Korea, applies for the extension of the existing approval of the specific component "check valve", type CVH2 series check valve, approval number E1 110R 000163, according to the ECE regulation 110.

The reason of the extension is the creation of a check-valve family by introducing the two versions CVH1 and CVH2. CVH1 is newly added, covering two additional port connection sizes.

The mandatory tests are based on the requirements of the ECE R110 including Supplement 9 of 2010-08-19.

The authorized Technical Service is the Typprüfstelle Fahrzeuge/Fahrzeugteile, TÜV Rheinland Kraftfahrt GmbH, Engineering Center TÜV Saarland automobil GmbH, Verkehrstechnik.

2 Check valve, type CVH2 series check valve

2.1 Intended use

The check valve is designed as an automatic valve which allows gas to flow in one direction only.

Operating Temperatures: -40°C <=> +120°C
 Service Pressure: 200 bar / 20 MPa at 15°C
 Working Pressure: 273 bar / 27.3 MPa at 120°C
 Class according to R110: 0

2.2 Design

The specific component „check valve“ is designed as a spring loaded non-return valve, see the technical drawings:

2011G111L01, revision 0 for the version CVH1 (extension)

2007A23D21, revision 0 for the version CVH2 (original approval)

The following table shows the possible variants:

type	version	extension	end connections dimension	
			inlet	outlet
CVH2	CVH2	-H6T	3/8"	
		-H8T	1/2"	
		-H8M	8 mm	
		-H10M	10 mm	
		-H12M	12 mm	
	CVH1	-H4T	1/4"	
		-H6M	6 mm	

2.3 Materials

The materials to be used including material data and the manufacturing/production parameters are fixed in the manufacturer's documentation and, if adequate, the technical drawings respectively.

Reference is made to the technical drawings of above and the related parts list. There was no change of the materials used nor of the respective suppliers and compounds.

Body and components in contact with gas: Stainless Steel 316
Seals: NBR, PTFE

Technischer Bericht Nr.: 07-7063-00-02
ECE Regelung Nr.: 110
Antragsteller: Hy-Lok Corporation
Typ: CVH2 series check valve

3 Documents to the approval

The test report includes the following documents:

Annex 1: Technical Drawings 2011G11L01, revision 0 and 2007A23D21, revision 0 with parts list

Annex 2: Confirmation letter regarding non-metallic components

4 Applicable regulations

ECE R110 including Supplement 9 of 2010-08-19

State of the art

5 Performed Tests

Subsequent to a detailed design verification it was found, that no additional tests have to be performed since the design changes—reduction of the dimensions of the inlet port and outlet port—are based on best engineering practice. In addition, to support this decision, a calculation of the component's strength was made at working pressure and at overpressure at the operating temperatures which proves the design variants to be safe.

result: without objections, successful

6 Conclusion

With its request dated 2011-07-13 the manufacturer Hy-Lok Corporation, 1467-1, Songjeong-Dong, Gangseo-Gu, Busan 618-817, South Korea, applies for the extension of the existing approval of the specific component "check valve", type CVH2 series check valve, approval number E1 110R 000163, according to the ECE regulation 110.

The reason of the extension is the creation of a check-valve family by introducing the two versions CVH1 and CVH2. CVH1 is newly added, covering two additional port connection sizes.

The mandatory tests are based on the requirements of the ECE R110 including Supplement 9 of 2010-08-19.

The authorized Technical Service is the Typprüfstelle Fahrzeuge/Fahrzeugteile, TÜV Rheinland Kraftfahrt GmbH, Engineering Center TÜV Saarland automobil GmbH, Verkehrstechnik.

All tests were successful.

The requirements of the ECE R 110 are met. There are no safety related technical objections.

Saarbrücken, 2011-07-15



Dr.-Ing. Stefan Behrning
Expert Pressure Equipment