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SURFACE VEHICLE STANDARD

SAE J2197

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Submitted for recognition as an American National Standard

HFC-134a (R-134a) SERVICE HOSE FITTINGS FOR AUTOMOTIVE AIR-CONDITIONING SERVICE EQUIPMENT

Foreword—The purpose of this SAE Standard is to establish specific but unique fittings for service equipment used in maintaining HFC-134a (R-134a) systems. This is necessary to avoid cross mixing of refrigerant and lubricants from CFC based systems. This applies only to systems specifically designed for or retrofitted to R-134a. Hermetically sealed appliances and refrigerated cargo systems are not covered by this document.

1. Scope

1.1 This SAE Standard covers fittings intended for connecting service hoses, per SAE J2196, from Mobile Air-Conditioning Systems to service equipment such as manifold gauges, vacuum pumps and air-conditioning charging, recovery and recycling equipment. (Figure 1)

1.2 Due to similarities between English and metric thread sizes a single, unique ACME thread fitting is specified. This fitting was recommended by the Compressed Gas Association (CGA), Connection Standards Committee Task Force as one which could be qualified to meet their requirements for use and safety in a time frame consistent with the introduction of R-134a. It was selected because its unique design would reduce the likelihood of cross-treading service hoses on R-12/R-134a refrigerant storage containers and service equipment.

1.3 The high and low pressure hose in J2196 requires the charge coupling (used to connect service hoses to vehicle access ports) to be an integral part of the hose assembly. To allow removal of the hose from the coupling for hose replacement only, a two-piece construction with a wrench tight connection is permitted. Specifications covering this fitting are provided.

2. References

2.1 Applicable Documents—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE Publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J639—Vehicle Service Coupling

SAE J2196—Service Hose for Automotive Air Conditioning

SAE J2210—HFC-134a Recycling Equipment for Mobile Air-Conditioning Systems

2.1.2 ARI PUBLICATIONS—Available from Air Conditioning and Refrigeration Institute, 1501 Wilson Boulevard, Sixth Floor, Arlington, VA 22209.

ARI 720—Refrigerant Access Valves and Hose Connectors

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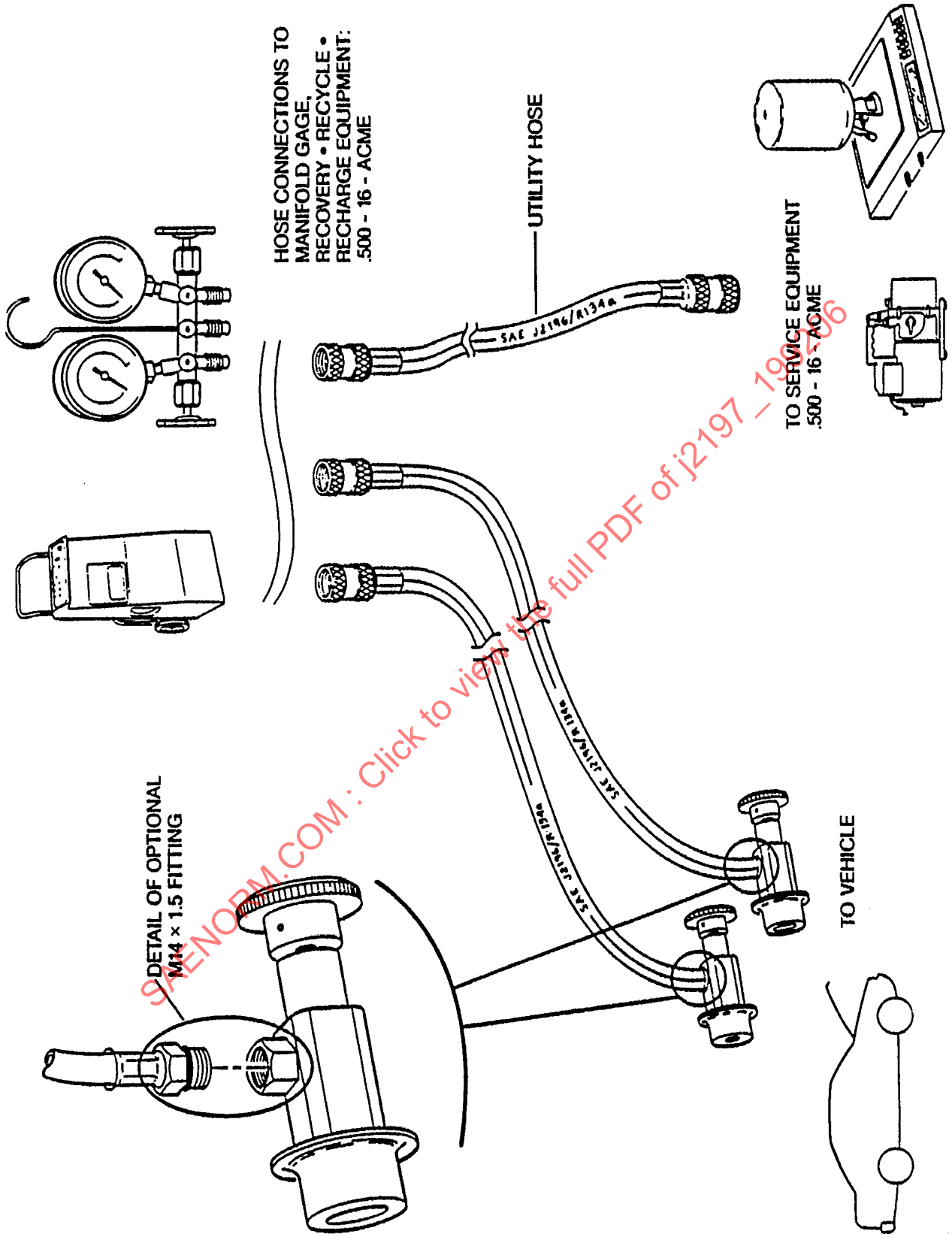

FIGURE 1—R-134a SERVICE EQUIPMENT

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3. Specification and Application Description

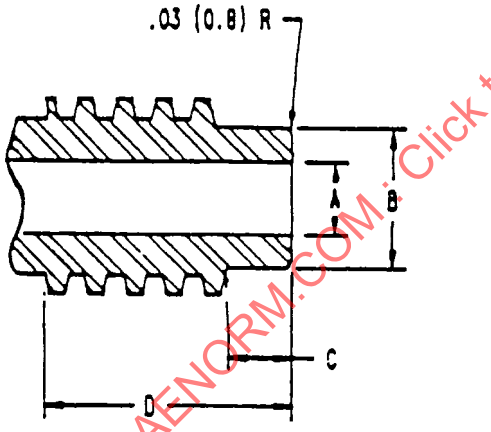
3.1 0.500 in × 16-2G ACME—Right Hand Thread, Cylinder Valve Outlet Connection—Compressed Gas Association, Inc. Connection No. 167. (Figure 2)

3.1.1 The Connection shall be used on all R-134a refrigerant storage containers liquid and vapor outlet connections. It will also be used for all R-134a service equipment including manifold gauge hose connections, utility hose connection to the vacuum pump, and charging, recovery and recycling equipment as defined in SAE J2210.

3.1.2 Applications which will require the use of valve cores should locate the valve core in accordance with ARI 720.

3.2 M14 × 1.5-6G right hand thread, SAE Hose Barb connection. (Figure 3)

LIMITED STANDARD CYLINDER VALVE OUTLET CONNECTION FOR PRESSURES UP TO 500 PSIG (3450 kPa) FOR TETRAFLUOROETHANE (R-134a) AUTOMOTIVE USE



	VALVE OUTLET
Thread	0.500 -16-ACME-2G-RH-EXT
Major Dia.	0.5000—0.4950 (12.700—12.573)
Pitch Dia.	0.4631—0.4514 (11.762—11.466)
Minor Dia.	0.4275—0.4215 (10.858—10.707)
Bore Dia. A	0.188 ± 0.002 (4.78 ± 0.05)
Relief Dia. B	0.360 ± 0.010 (9.14 ± 0.25)
Cut Back C	0.16 (4.1)
Full Thread D	0.625 Min. (15.88) Min.

Dimensions are in (mm)

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FIGURE 2—0.500 in—16-ACME-2G-RH-EXT

3.2.1 This fitting may be used as an option to a nonserviceable connection of the charge coupling to the service hose assembly and will require a secure, wrench tight connection.

4. Functional Description

4.1 The high pressure hose assembly shall meet SAE J2196 requirements and will be terminated at one end with the 0.500 in × 16—ACME threaded nut. The other end will be permanently attached to the SAE J639 service charge coupling or terminated with the optional M14 × 1.5-6G external thread/male hose barb fitting.

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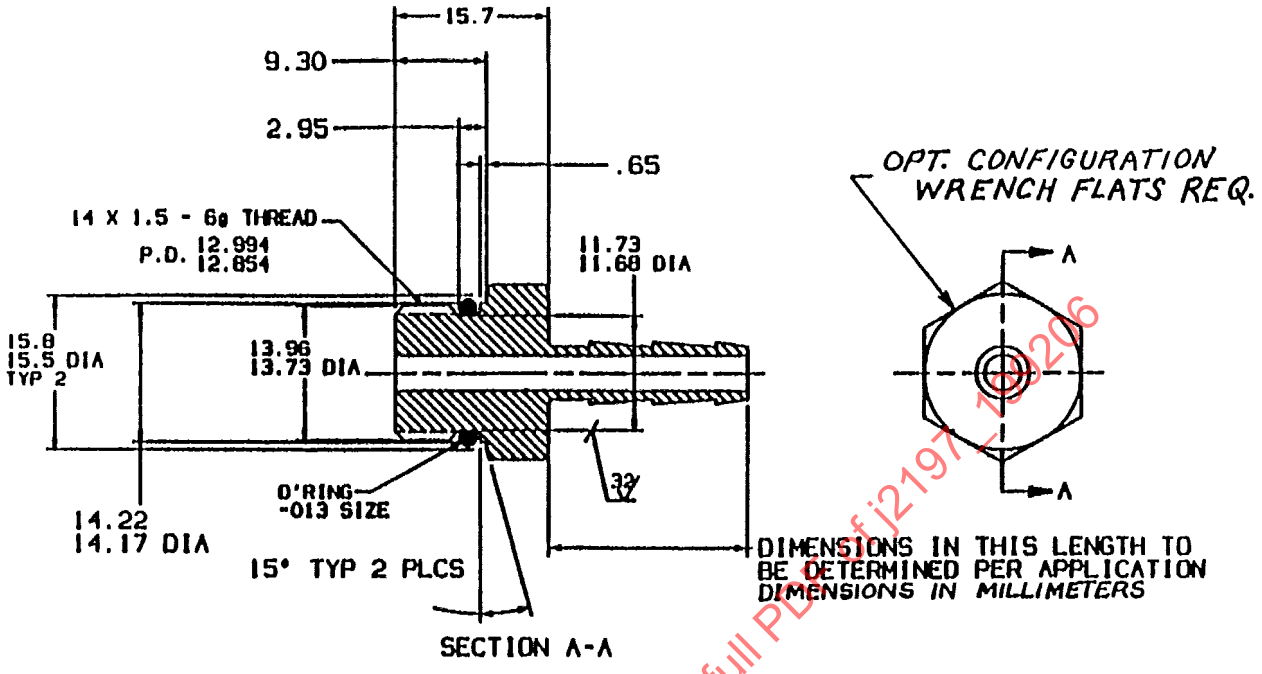

FIGURE 3—SAE HOSE BARB R-134a SERVICE ADAPTER

4.2 The low pressure hose assembly shall meet SAE J2196 requirements and will be terminated at one end with the 0.500 in × 16—ACME threaded nut. The other end will be permanently attached to the SAE J639 service charge coupling or terminated with the optional M14 × 1.5-6G external thread/male hose barb fitting.

4.3 The utility hose shall meet SAE J2196 requirements and will be terminated at both ends using 0.500 in × 16—ACME threaded nut.

4.3.1 Utility hose used on four hose gauge systems should conform to requirements.

4.4 Manifold Gauge Assembly shall require three or four 0.500 in × 16—ACME male threaded connections.

4.5 Containers disposable or refillable shall require 0.500 in × 16—ACME male threaded connections with shut off valves.

4.6 Refrigerant recovery, charging stations and stand-alone vacuum pumps shall require 0.500 in × 16—ACME male threaded connection unless an internal, nonserviceable connection is made by the equipment manufacturer.

4.7 High and low pressure charge couplings shall be constructed with an internal, M14 × 1.5-6H right hand thread connection as an option to attaching the hose assembly with a nonserviceable connection. (Figure 4)

5. Testing—This test procedure is for the qualification of new connection for R-134a automotive air-conditioning system service equipment.

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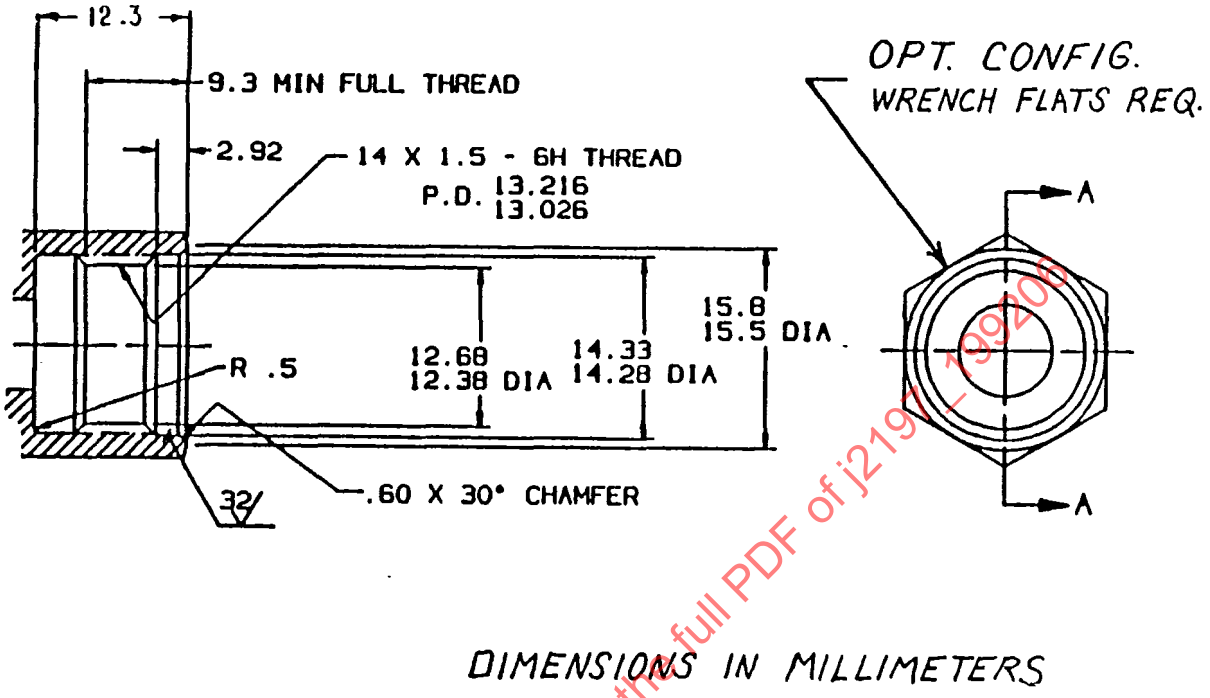

FIGURE 4—SAE SPUD R-134a SERVICE ADAPTER

5.1 Determine the minimum torque necessary for a gas tight shutoff between the nipple and valve body at a gas pressure equal to the maximum rated working pressure per SAE J2196. For cycling purposes, twice this shutoff torque will be used to simulate normally applied field torque.

5.2 Cycling is to be conducted at atmospheric pressure, since that is the pressure at which connections are normally made.

5.3 Before and after cycling, measurements of the connection shall be recorded (such as threaded elements, nipple bore diameters, and any other dimensions that may be subject to change) due to repeated tightenings.

5.4 Each connection is to be cycled 500 times with tightening to the torque determined in 5.1. One cycle consists of tightening to the predetermined torque and then loosening to, at most, finger tight.

5.5 After each 100 cycles, the torque required to achieve gas tight shutoff at test pressure shall be recorded to determine if there is any abnormal torque buildup in shutoff requirements. The measurements indicated in 5.3 shall also be recorded at this interval to determine if there is any abnormal deformation of parts.

5.6 Each connection shall be subjected to a hydrostatic test and must withstand a pressure of a least 4 times the maximum rated working pressure per SAE J2196 without structure failure.

5.7 After completion of the previous tests, the results will be recorded on a suitable test report form which will be kept on file at the Compressed Gas Association office.

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5.7.1 Testing of either a left hand or right hand connection of identical design (except for thread direction) automatically qualifies the untested connection of the opposite thread direction. (The direction of the thread does not effect the structural integrity of the design.)

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