SAE International™ SURFACE VEHICLE STANDARD

SAE J1754-3 FEB2010

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# Hose Assemblies, Hydraulic, J517 100R Series Hose—Part 3: Procurement and Ordering Information

RATIONALE

This new proposed SAE J1754-3 standard is intended to establish general specifications, performance requirements and uniform methods for testing and evaluation of hydraulic hose assemblies using SAE Standard J517 100R Series hoses and connectors specified in SAE Standard J516 or all parts of ISO 12151. See SAE J1754-3, Table 1 for SAE 100R Series hoses and identification codes. Use SAE J1754-2 for all other hose assemblies.

Errors in the sleeve codes in Table 3, Appendix A and Appendix B were corrected.

## 1. SCOPE

This SAE Standard covers procurement and ordering information for hose assemblies using SAE Standard J517 100R Series hoses and connectors specified in SAE Standard J516 or all parts of ISO 12151 for use in hydraulic systems using petroleum based hydraulic fluids.

NOTE: Working pressure is defined as maximum system pressure.

## 2. REFERENCES

### 2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. The latest issue of the publications shall apply.

#### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J343 Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies

SAE J516 Hydraulic Hose Fittings

SAE J517 Hydraulic Hose

SAE J846 Coding Systems for Identification of Fluid Conductors and Connectors

SAE J1754-1 Hose Assemblies, Rubber, Hydraulic, Steel Wire Reinforced—Part 1: Procurement Document

SAE J1754-2 Hose Assemblies, Rubber, Hydraulic, Steel Wire Reinforced—Part 2: Ordering Information





**TO PLACE A DOCUMENT ORDER:** **Tel: 877-606-7323 (inside USA and Canada)**
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SAE WEB ADDRESS: http://www.sae.org

**SAE values your input. To provide feedback on this Technical Report, please visit**
**http://www.sae.org/technical/standards/J1754/3_201002**

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 117 Standard Test Method of Salt Spray (Fog) Testing

2.1.3 ISO Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 4406 Hydraulic fluid power—Fluids—Method of coding level of contamination by solid particles

ISO 12151-1 Connections for hydraulic fluid power and general use—Hose fittings—Part 1: Hose fittings with ISO 8434-3 O-ring face seal ends

ISO 12151-2 Connections for hydraulic fluid power and general use—Hose fittings—Part 2: Hose fittings with ISO 8434-1 24° cone ends

ISO 12151-3 Connections for hydraulic fluid power and general use—Hose fittings—Part 3: Hose fittings with ISO 6162 flange ends

ISO 12151-4 Connections for hydraulic fluid power and general use—Hose fittings—Part 4: Hose fittings with ISO 6149 metric stud ends

ISO 12151-5 Connections for hydraulic fluid power and general use—Hose fittings—Part 5: Hose fittings with ISO 8434-2 37° flare ends

ISO 12151-6 Connections for hydraulic fluid power and general use—Hose fittings—Part 6: Hose fittings with ISO 8434-6 60° cone ends

2.2 Related Publications

The following publications are for information purposes only and are not a required part of this document.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J1176 External Leakage Classifications for Hydraulic Systems

SAE J1273 Recommended Practices for Hydraulic Hose Assemblies

SAE J1405 Optional Test Procedures for Hydraulic Hose Assemblies

2.2.2 ISO Publications

Available from ANSI, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 3448 Industrial liquid lubricants—ISO viscosity classification

ISO 4397 Fluid power systems and components—Connectors and associated components—Nominal outside diameters of tubes and nominal inside diameters of hoses

## 3. REQUIREMENTS

### 3.1 Hose Assembly Construction

Hose used in assemblies shall be per SAE J517. Connectors shall be in accordance with either SAE J516 or ISO 12151 and capable of meeting the performance requirements of this standard.

### 3.2 Dimensions

Hose shall conform to all the dimensions in SAE J517. Hose concentricity shall be in accordance with SAE J1754-1, Table 11. Connector dimensions shall be per SAE J516 or ISO 12151. Hose assemblies shall conform to the applicable part standard or engineering drawing. Double bent tube (double elbow) assemblies are not recommended and are considered non-standard due to the detrimental effects of twist on the hose.

### 3.3 Hose Classifications

Hose assemblies shall conform to SAE J1754-1, Table 12, Class C.

### 3.4 Performance

Hose assemblies shall satisfy the performance requirements in SAE J1754-1 paragraph 4.3.

### 3.5 Application Factors

See application factors in SAE J1754-1 paragraph 3.5.

### 3.6 First Time Suppliers

When required by the purchaser, first time suppliers of each hose assembly size may need to supply documentation that products meet the requirements of SAE J1754-1 paragraphs 4.3.1 through 4.3.9.

### 3.7 Age Control

See age control requirements in SAE J1754-1 paragraph 3.7.

### 3.8 Marking

See marking requirements in SAE J1754-1 paragraph 3.8.

### 3.9 Workmanship

Workmanship shall be of the quality necessary to produce hose assemblies free from all defects that could affect proper form, fit and function in service.

### 3.10 Cleanliness

Hose assemblies shall meet the cleanliness requirement of ISO 4406 Code Number 19 / 16 with no particle size exceeding 0.8 mm or the cleanliness requirement specified by the purchaser.

### 3.11 Finish

The external surfaces and threads of carbon steel parts shall be plated or coated with a suitable material that passes a 96 h salt spray test in accordance with ASTM B 117. Any appearance of red rust during the 96 h salt spray test shall be considered failure, except for the following:

a. All internal fluid passages.

b. Edges such as hex points, serrations and crests of threads where there may be mechanical deformation of the plating or coating typical of mass-produced parts or shipping effects.

c. Areas where there is mechanical deformation of the plating or coating caused by crimping, flaring, bending and other post-plate metal forming operations.

d. Areas where the parts are suspended or affixed in the test chamber where condensate can accumulate.

Parts manufactured to this document shall not be cadmium plated. Hexavalent chromate coatings are not preferred for commercial and industrial usage due to environmental reasons. Internal fluid passages shall be protected from corrosion during storage and shipping. Changes in plating may affect torque and require re-qualification, when applicable.

## 4. TESTS

Tests are conducted in accordance with SAE J343 unless otherwise specified.

### 4.1 Responsibility for Tests

See responsibility for tests in SAE J1754-1 paragraph 4.1.

### 4.2 Classification of Tests

See classification of tests in SAE J1754-1 paragraph 4.2.

### 4.3 Qualification Tests

See qualification tests in SAE J1754-1 paragraph 4.3.

### 4.4 Quality Conformance Tests

See quality conformance tests in SAE J1754-1 paragraph 4.4.

## 5. PRODUCT APPROVAL

See SAE J1754-2 for agreement between purchaser and supplier.

## 6. PACKAGING

Packaging shall be as specified in the contract or purchase order, or as agreed upon between the purchaser and supplier.

## 7. ORDERING DATA

The following data shall be required when ordering per this standard:

a. Title and date of this document.

b. Applicable design parts standard and/or engineering drawing.

c. Connector material.

d. Quantity.

e. When qualification testing is required per paragraph 3.6 and 4.3.

f. When performance tests are specified per SAE J1754-1 paragraph 4.4.2.

g. Type of packaging required.

TABLE 1 - SAE J 517 100R SERIES HOSE CODES

| J517 100R Hose[1] | R1AT | R1S | R2AT | R2S | R3 | R4 | R5 | R6 | R7 | R8 | R12 | R13 | R14A | R14B | R15 | R16 | R16S | R17 | R18 | R19 | ---[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J846 Designation | 53 | 95 | 54 | 55 | 44 | 45 | 46 | 47 | 48 | 49 | 77 | 78 | 79 | 80 | 90 | 91 | 99 | 93 | 94 | A5 | XX |

1. See SAE J517, Appendix B1or SAE J846.
2. See drawing for operating pressure rating.

TABLE 2 - HOSE AND CONNECTOR SIZE IDENTIFICATION CODES

| SAE HOSE DASH SIZE[1] | | 02 | 03 | 04 | 05 | 06 | 08 | 10 | 12 | — | 16 | 20 | 24 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO HOSE SIZE(2) | | 3.2 | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 19 | — | 25 | 31.5 | 38 | 51 | 63 |
| LETTER DESIGNATION | | **C** | **D** | **E** | **F** | **G** | **H** | **J** | **K** | **—** | **N** | **P** | **R** | **T** | **U** |

NOTE: Hose size columns line up with the appropriate standard connector end size in Table 3B.

| SAE CONNECTOR DASH SIZE[3] | CODE | 02 | 03 | 04 | 05 | 06 | 08 | 10 | 12 | 14 | 16 | 20 | 24 | 32 | 40 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO 12151-1 CONNECTOR SIZE[4] | **S** | — | — | 6 | 8 | 10 | 12 | 16 | 20 | — | 25 | 30 | 38 | — | — |
| ISO 12151-2 CONNECTOR SIZE-L[5] | **L** | — | 6 | 8 | 10 | 12 | 15 | 18 | 22 | — | 28 | 35 | 42 | — | — |
| ISO 12151-2 CONNECTOR SIZE-S[6] | **S** | — | 8 | 10 | 12 | — | 16 | 20 | 25 | — | 30 | 38 | — | — | — |
| ISO 12151-3 CONNECTOR SIZE-L[5] | **L** | — | — | — | — | — | 13 | — | 19 | — | 25 | 32 | 38 | 51 | — |
| ISO 12151-3 CONNECTOR SIZE-S[6] | **S** | — | — | — | — | — | 13 | — | 19 | — | 25 | 32 | 38 | 51 | — |
| ISO 12151-4 CONNECTOR SIZE-L[5] | **L** | — | — | M12 | M14 | M16 | M18 | M22 | M27 | — | M33 | M42 | M48 | — | — |
| ISO 12151-4 CONNECTOR SIZE-S[6] | **S** | — | — | M12 | M14 | M16 | M18 | M22 | M27 | — | M33 | M42 | M48 | — | — |
| ISO 12151-5 CONNECTOR SIZE[7] | **L** | — | — | 6 | 8 | 10 | 12 | 16 | 20 | — | 25 | 30 | 38 | 50 | — |
| ISO 12151-6 CONNECTOR SIZE[7] | **L** | — | 6 | 8 | — | 10 | 12 | 16 | 20 | — | 25 | 30 | 38 | 50 | — |
| LETTER DESIGNATION | | **C** | **D** | **E** | **F** | **G** | **H** | **J** | **K** | **M** | **N** | **P** | **R** | **T** | **U** |

1. Hose dash size is based on inches, with each dash size equal to 1/16 inch.
2. ISO hose size is based on the equivalent SAE J517 inch hose sizes per ISO 4397.
3. Connector dash size is based on inch tubing, with each dash size equal to 1/16 inch.
4. ISO connector size is based on ISO 12151-1 with S (Heavy duty series) only.
5. ISO connector size is based on ISO 12151-2, 3 and 4 with L (Light duty series).
6. ISO connector size is based on ISO 12151-2, 3 and 4 with S (Heavy duty series).
7. ISO connector size is based on ISO 12151-5 and 6 with L (Light duty series) only.



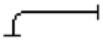
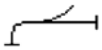
NOTE: In Appendix B drawing, the end sizes will need to be filled in the blank space, due to the different end sizes in each of the ISO 12151 standards for each letter code. Example: If a 12151-1 end connection with a 13/16-16 UN thread is used, the size and code would be 12 / H.

TABLE 3 - SLEEVE CODES[1]

| Code | Sleeve Type |
|---|---|
| **A** | Steel Flat Armor Guard |
| **B** | Steel Round Spring Guard |
| **C** | Thermoplastic Sleeve |
| **D** | Textile Polyamide Sleeve |
| **E** | Fire Sleeve |
| **F** | Plastic Flat Armor Guard |
| **W** | None |
| **X** | See Drawing |

1. Full length sleeve over entire hose is assumed on hose assembly. If partial length sleeve is required on hose assembly, place an "X" to see drawing.

TABLE 4 - HOSE CURVATURE ORIENTATION CODES[1]

| | | | | | |
|---|---|---|---|---|---|
| **Top** |  |  | | | **Not** |
| **Front** |  |  |  |  | **Required** |
| **VIEW** | **P** | **R** | **T** | **U** | **W** |

1. Hose curvature orientation to be used when required for ease of assembly.

TABLE 5 - HOSE OPERATING TEMPERATURE RANGE CODES

| Code | Temperature Range |
|---|---|
| **A** | Same as SAE J517 100R series specification |
| **X** | See drawing for hose temperature rating |

TABLE 6 - HOSE FITTING COUPLING ATTACHMENT TYPE CODES[1]

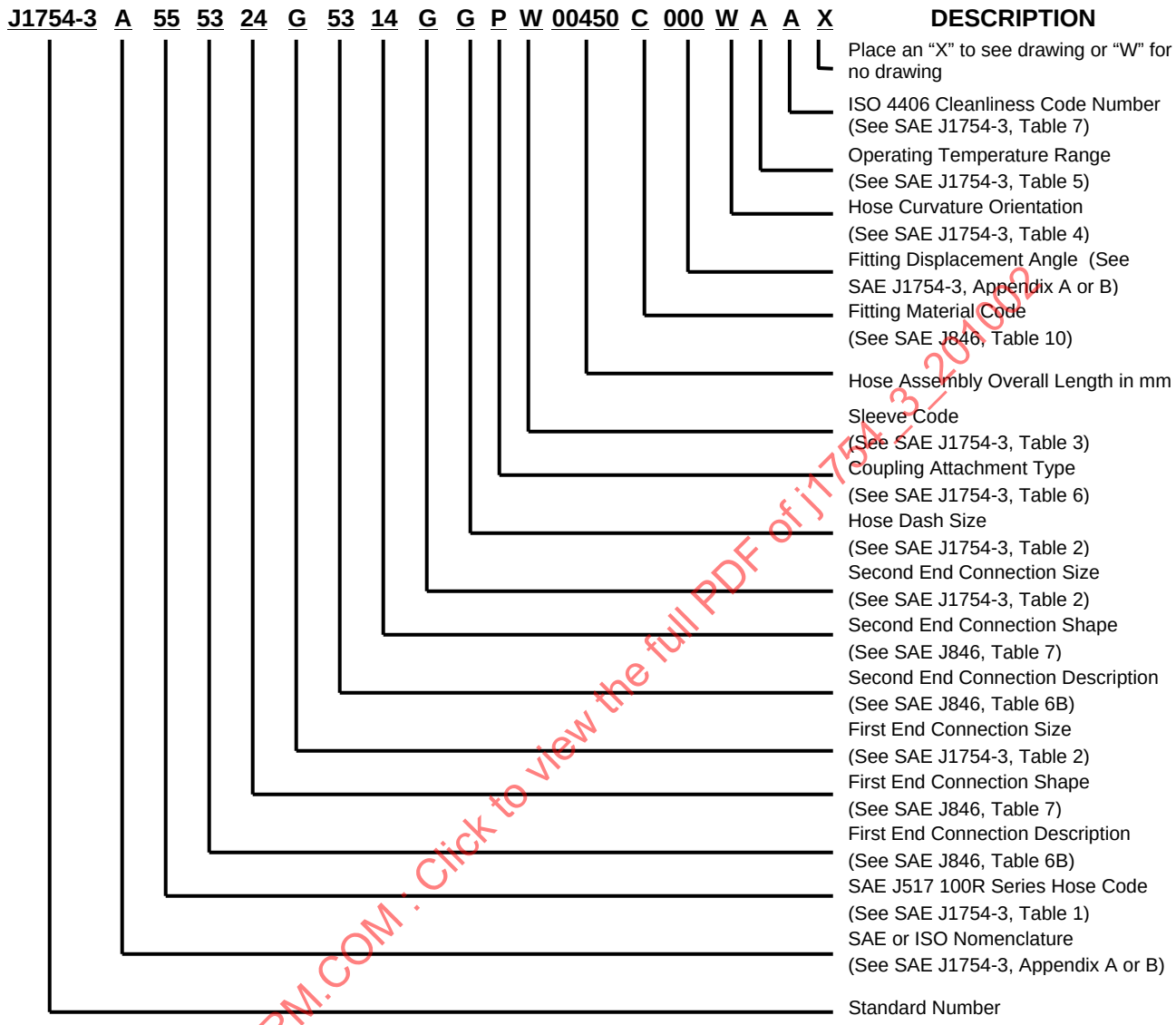
| Code | Coupling Attachment Type |
|---|---|
| **C** | Worm gear clamp for use with SAE J1231 beaded ends and SAE 100R3 and 100R4 type hoses |
| **F** | Field attachable (screw together) |
| **M** | Field attachable (screw together), for assembly with a mandrel and SAE 100R5 type hoses |
| **P** | Permanently attached |
| **S** | Field attachable (segment clamp) |
| **X** | See drawing for hose fitting coupling attachment type |

1. Letter codes are per J846 identification coding.

TABLE 7 - ISO 4406 CLEANLINESS REQUIREMENT CODES

| Code | Cleanliness Requirement |
|---|---|
| **A** | Per SAE J1754-1 Part 1, ISO 4406 cleanliness requirement |
| **B** | ISO 4406 code 18/13 with maximum particle size of 0.5 mm in the largest dimension |
| **X** | See drawing for cleanliness requirement |

7.1 Part Identification Numbers






**Example of Hose Assembly Part Number: J1754-3A555324G5314GGPW00450C000WAAX**

NOTE 1: “X” to be used for identifying special conditions that require a drawing.
NOTE 2: “W” to be used for identifying all letters not required in the coding identification.
NOTE 3: “0” to be used for identifying all numbers not required in the coding identification.

FIGURE 1 - EXAMPLE OF HOSE ASSEMBLY PART NUMBER

## 8. NOTES

### 8.1 Marginal Indicia

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

PREPARED BY THE SAE FLUID CONDUCTORS AND CONNECTORS TECHNICAL STEERING COMMITTEE C2—HYDRAULIC HOSE AND HOSE FITTINGS