INTERNATIONAL STANDARD

ISO 17567

Second edition
2020-08

Agricultural and forestry tractors and implements — Hydraulic power beyond

Tracteurs agricoles et forestiers et instruments — Puissance hydraulique externe disponible

Reference number
ISO 17567:2020(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

This second edition cancels and replaces the first edition (ISO 17567:2005), which has been technically revised.

The main change compared to the previous edition is as follows:

— reassignment of flow classes and corresponding flow rates for each of the classes of hydraulic power beyond connections.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The number of implements and mounted equipment attached to agricultural and forestry tractors requiring the hydraulic power and control offered by the tractor's hydraulic system has greatly increased in complexity and need for efficient operation in recent years. As a result, many of these implements include specialized valves and require the capability to easily connect, interface, and control the tractor's implement hydraulic system. This document sets forth the interfaces necessary to effectively and properly accomplish the connection of various tractor and implement combinations.

Agricultural and forestry tractors and implements — Hydraulic power beyond

1 Scope

This document defines hydraulic power beyond. It specifies the number, type, capacity, and identification of the connections between agricultural and forestry tractors and implements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5598, *Fluid power systems and components — Vocabulary*

ISO 10448, *Agricultural tractors — Hydraulic pressure for implements*

ISO 16028, *Hydraulic fluid power — Flush-face type, quick-action couplings for use at pressures of 20 MPa (200 bar) to 31,5 MPa (315 bar) — Specifications*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
hydraulic power beyond
agricultural and forestry tractor's hydraulic power and/or control features available to implements independent of the tractor's remote valves

3.2
pressure port
connection used to provide access to the tractor's main source of hydraulic power

3.3
return port
connection for the return flow from the implement or attached equipment

3.4
load signal (pressure) port
connection used to provide access to the tractor's control signal network

3.5
drain port
connection used to provide access to the tractor's lowest pressure *return port* (3.3) for flows such as motor internal leakage

3.6
hydraulic power beyond kit
kit provided by agricultural and forestry tractor manufacturers that includes all brackets, fittings, seals, lines, quick couplings, dust protection, instructions for installation [including flow class reference, load signal (pressure) drop values, and return pressure] on the tractor, and instructions for connection of implements to the *hydraulic power beyond* (3.1) ports

4 Systems

4.1 Open centre hydraulic systems

On agricultural and forestry tractor systems with open centre position hydraulic valves, as defined in ISO 5598, the pressure, return, and drain ports are needed. Figure 1 shows two basic methods for hydraulic power beyond interfaces (power beyond priority or tractor valve priority) for a typical hydraulic motor connected to a tractor with an open centre hydraulic system.

4.2 Constant pressure closed centre hydraulic systems

On agricultural and forestry tractor systems with closed centre position hydraulic valves, as defined in ISO 5598, the pressure, return, and drain ports are needed. Figure 2 shows one basic method for a hydraulic power beyond interface for a typical hydraulic motor connected to a tractor with a constant pressure closed centre hydraulic system.

4.3 Load sensing closed centre hydraulic systems

4.3.1 On agricultural and forestry tractor systems with load sensing hydraulic valves, the pressure, return, load signal (pressure), and drain ports are needed. Figure 3 shows one basic method for a hydraulic power beyond interface for a typical hydraulic motor connected to a tractor with a load sensing hydraulic system.

4.3.2 The signal from the implement connected to the load signal pressure port shall be resolved with the load signal from the tractor's valves before being sent to the pump. This resolution valving or circuitry shall be provided by the agricultural and forestry tractor manufacturer. The implement manufacturer shall ensure that their load signal is vented when all external functions are in their hold or neutral position.

4.4 Load sensing closed centre hydraulic systems with fixed displacement pump

Figure 4 shows one basic method for a hydraulic power beyond interface for a typical hydraulic motor connected to a tractor with a load sensing closed centre hydraulic system. 4.3.1 apply.

5 Hydraulic power beyond flow class as specified for a single connection

Hydraulic power beyond flow classes as specified for a single connection are given in Table 1.

Table 1 — Flow class

Class	Flow l/min [a, b]	Rated flow based on coupler performance l/min [c]
1	Up to 90	Up to 45
2	Up to 148	Up to 74
3	Up to 220	Up to 100
4	Up to 450	Up to 220

[a] Pressure port flow available can vary with system type and tractor system function.

[b] At rated engine speed.

[c] Flow values based on rated flow from ISO 16028.

6 Requirements

Agricultural and forestry tractor manufacturers should provide one or more set(s) of hydraulic power beyond ports.

Agricultural and forestry tractor manufacturers shall specify the maximum hydraulic power beyond flow class and system type for each set of hydraulic power beyond ports. Pressure and temperature characteristics shall be in accordance with ISO 10448. Drain port back pressure shall not exceed 100 kPa, gauge, at 20 l/min and 25 kPa, gauge, at zero flow conditions.

When quick-action couplings are used, female halves in accordance with ISO 16028 shall be mounted on tractors to create a uniform system interface between manufacturers and system types as follows.

Sizes of hydraulic power beyond quick action couplings in accordance with ISO 16028 are given in Table 2.

Table 2 — Quick action couplings

Hydraulic power beyond	Quick-action coupling size			
Flow class	**Pressure**	**Return**	**Load signal**	**Drain**
1	1x Size 12,5	1x Size 16	Size 6,3	Size 10
2	1x Size 16	1x Size 19		
3	1x Size 19	1x Size 25		
4	2x Size 19	2x Size 25		

The quick-action pressure coupling shall have self-sealing capability and shall not allow connection to be made while engine is running.

The quick-action return, load signal (pressure), and drain couplings should have connect under pressure capability but shall have the flow path open after connection.

All quick-action couplers shall have breakaway functionality as defined in ISO 5598.

Port and quick-action coupling identification:

— The hose ends of the implement shall be identified with alphabetical symbols given in Table 3.

— The ports and the quick-action couplings on the tractor, originally equipped or installed as part of the hydraulic power beyond kit, shall be identified with alphabetical symbols given in Table 3.

Table 3 — Port/coupler indentification

Port/coupler symbol	Port type
P	Pressure
R	Return
LS	Load sense
D	Drain

The maximum pressure drop from the supply port of the tractor to the load signal of the work port of the implement control valve shall be considered when designing power beyond circuits.

The tractor manufacturer shall state the load signal (pressure) pressure drop available at rated flow between the power beyond pressure and load signal (pressure) quick-action couplings.

The tractor manufacturer shall provide information for connection of hydraulic power beyond circuits and implement manufacturer shall provide instructions for connection of their implement to the tractor system types it is designed for.

7 Testing hydraulic power beyond systems capabilities

NOTE For testing load sensing closed centre hydraulic systems, see Figure 5.

Flow and power from hydraulic power beyond pressure port should be measured according to ISO/OECD 789-10 with the engine running at rated speed.

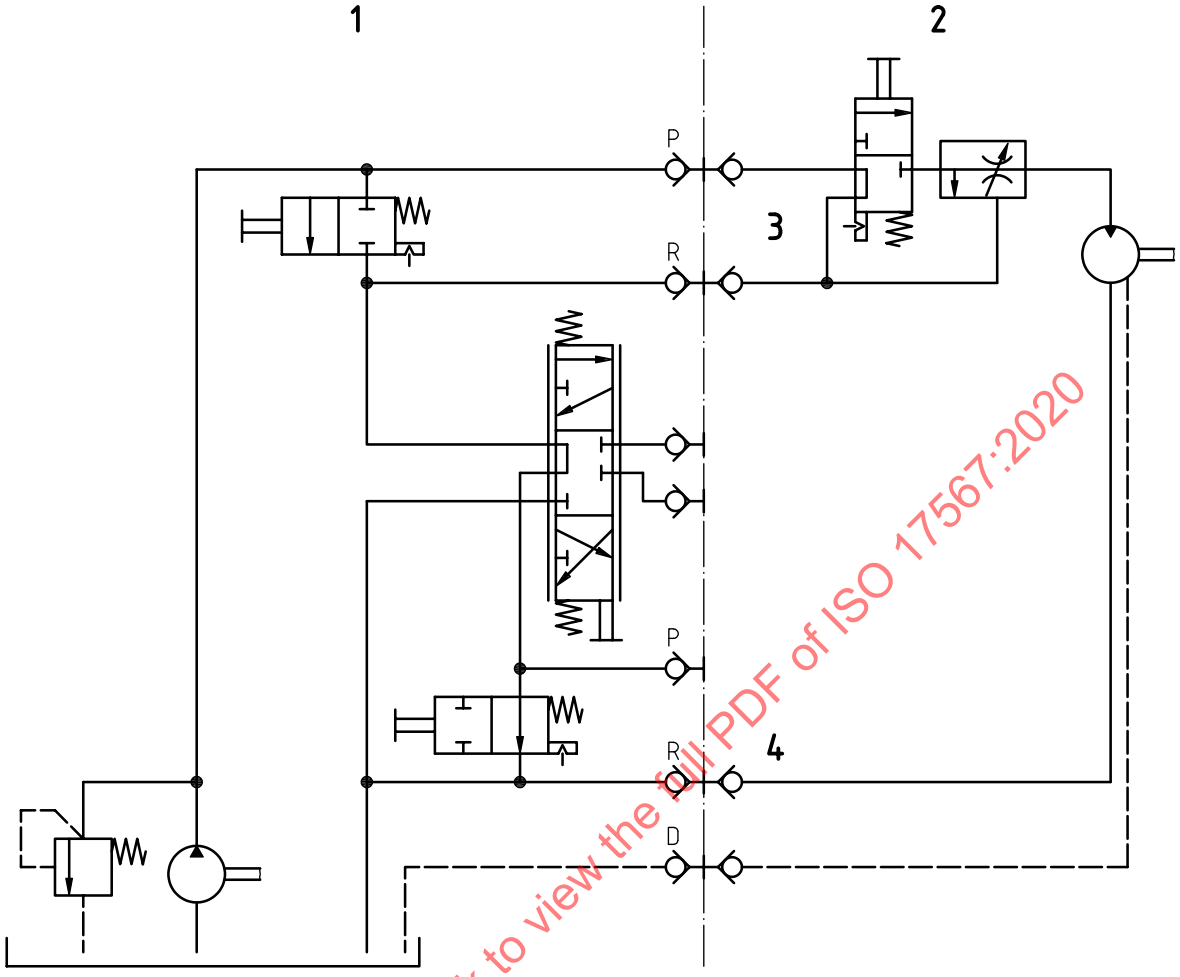
Return port pressure should be measured per Clause 8 with and without quick-action couplings.

Drain port pressure should be measured according to ISO/OECD 789-10, with and without quick-action couplings. For flow, see Clause 6.

Load signal (pressure) pressure drop available should be measured as the maximum pressure differential achievable across a throttle valve mounted close to the pressure port at rated flow.

8 Location and connections

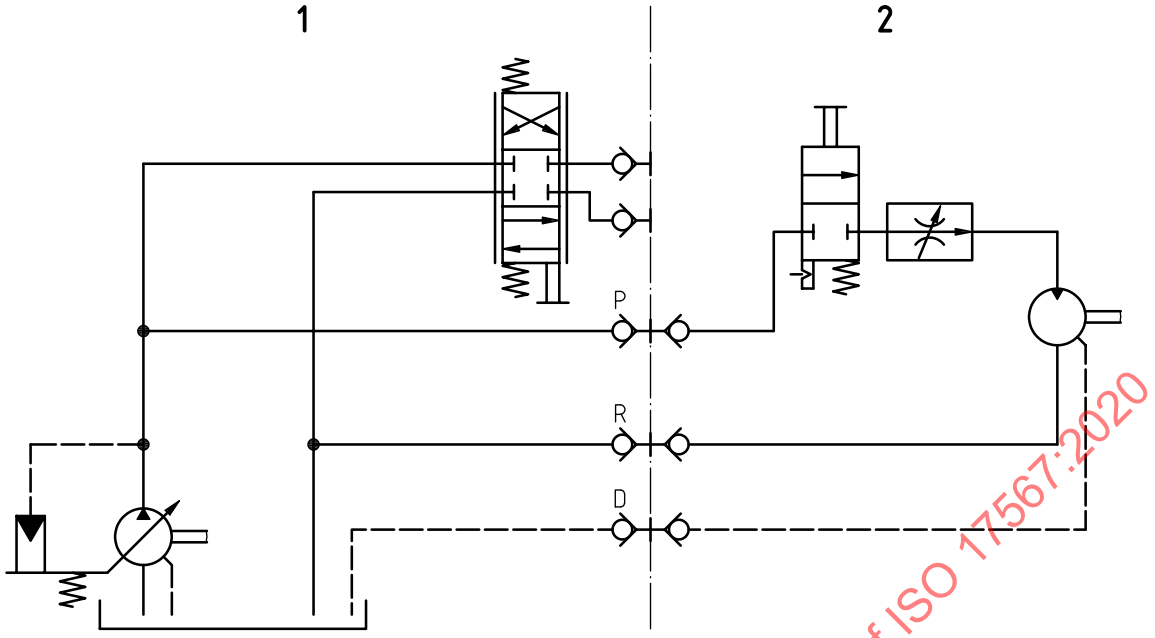
The connections may be located as specified according to ISO 5675.



Key

1 tractor circuit
2 implement circuit
3 tractor priority
4 power beyond priority

Figure 1 — Open centre hydraulic system

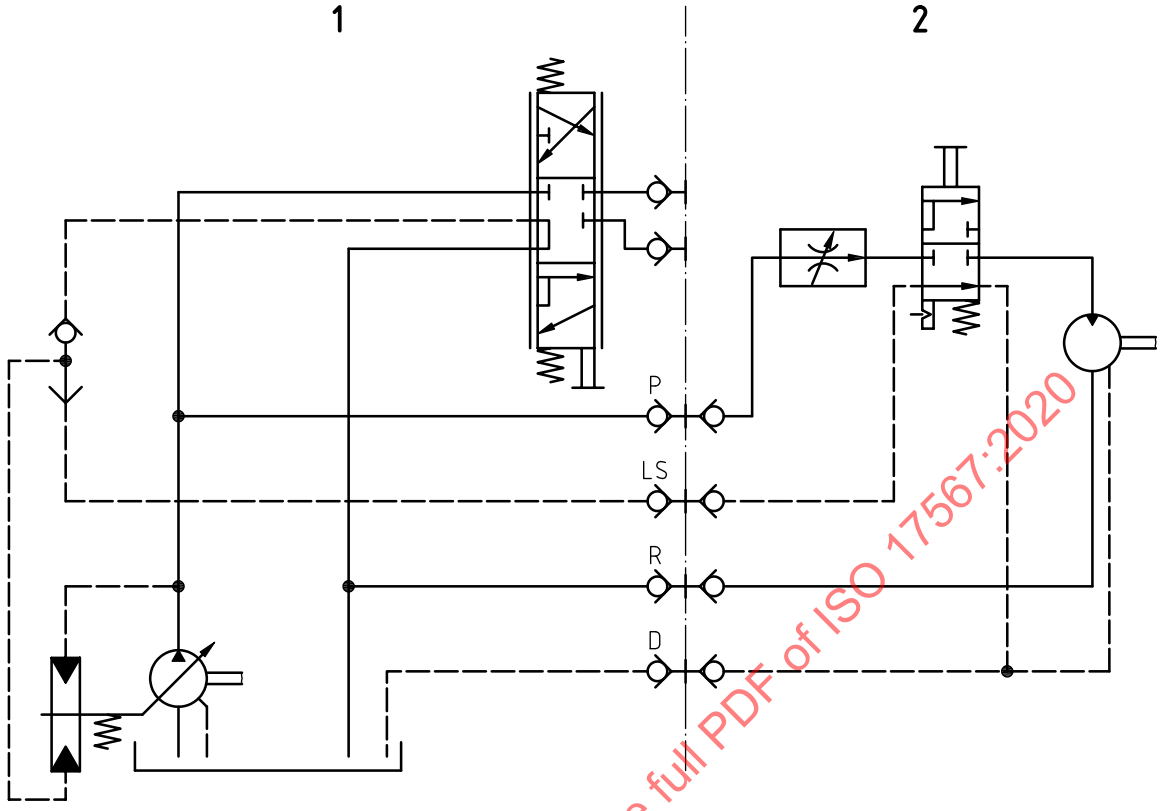


Key

1 tractor circuit

2 implement circuit

Figure 2 — Constant pressure closed centre hydraulic system

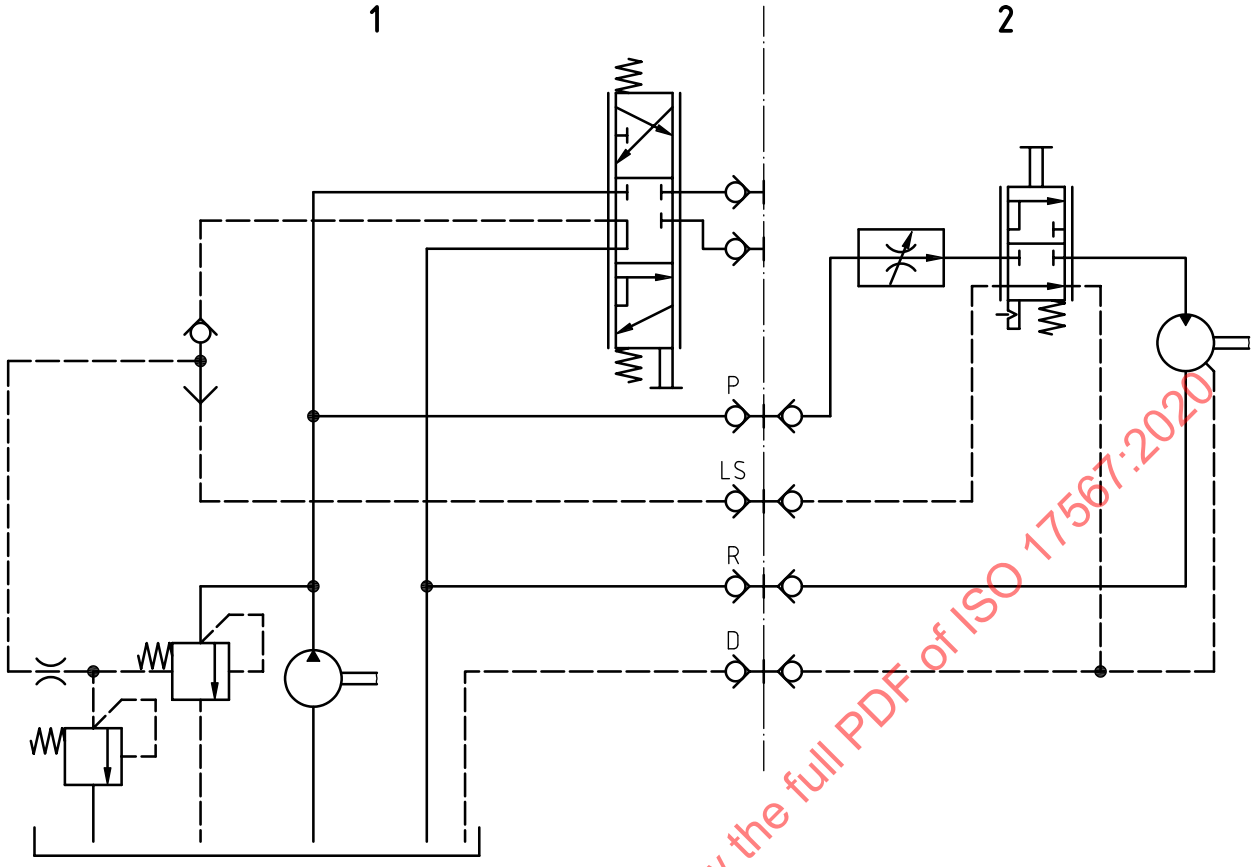


Key

1 tractor circuit

2 implement circuit

Figure 3 — Load sensing closed centre hydraulic system



Key

1 tractor circuit

2 implement circuit

Figure 4 — Load sensing closed centre hydraulic system with fixed displacement pump