

**Wiring Instructions for 2301A Controls
Replacing Caterpillar 2301 Controls**

IMPORTANT



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DEFINITIONS

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

WARNING

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.



Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.



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Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

NOTICE

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

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Introduction

The following 2301 speed control is no longer in production, and has been replaced by an updated 2301A speed control (both fixed speed and variable speed versions):

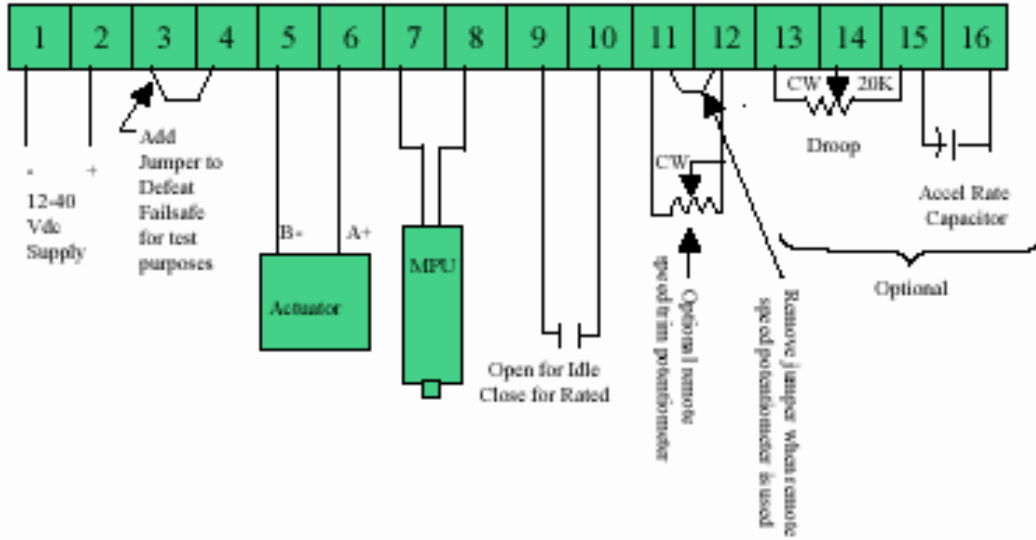
Old 2301		Recommended Replacement 2301A	
Woodward part number	Caterpillar part number	Woodward part number	Caterpillar part number
8272-689	4W-5790	9907-014	131-5453

Refer to Woodward manual 82020 for details on control installation, operation, adjustment, and troubleshooting.

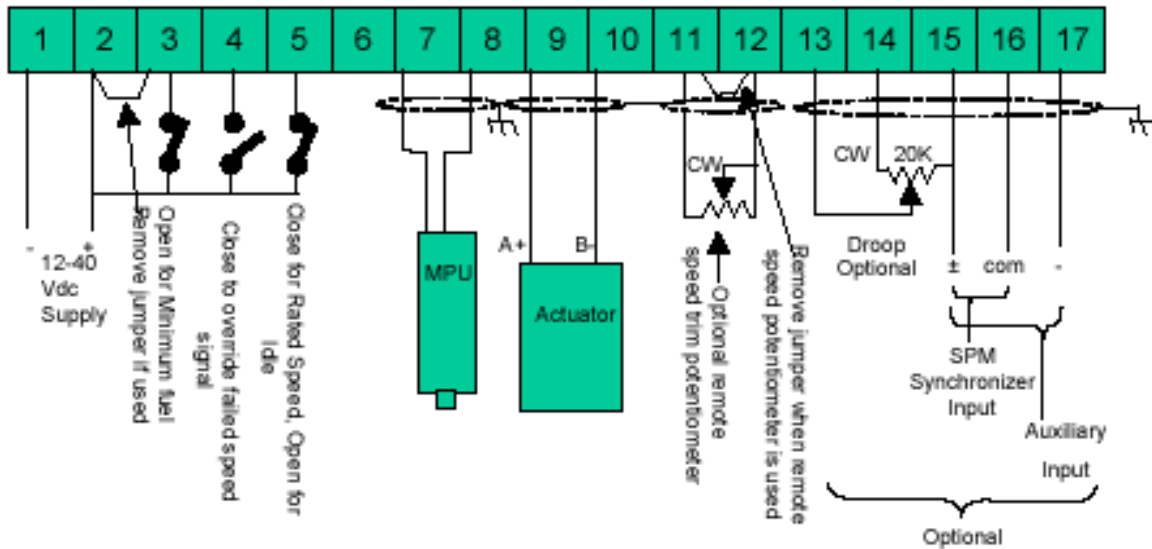
Fixed Speed Version

Woodward 2301 speed control 8272-689 (Caterpillar part number 4W-5790) is no longer in current production. The improved standard 2301A speed control 9907-014 (Caterpillar part number 131-5453) is recommended for replacement. Due to internal control design differences, the customer wiring to the control terminals is different. This application sheet illustrates the differences in wiring. Refer to Woodward manual 82020 for control installation, operation, adjustment, and troubleshooting.

**Old Standard Wiring Speed Control 8272-689 (Cat # 4W-5790)
(Fixed Speed)**



**New Standard Wiring Speed Control 9907-014 (Cat # 131-5453)
(Fixed Speed)**

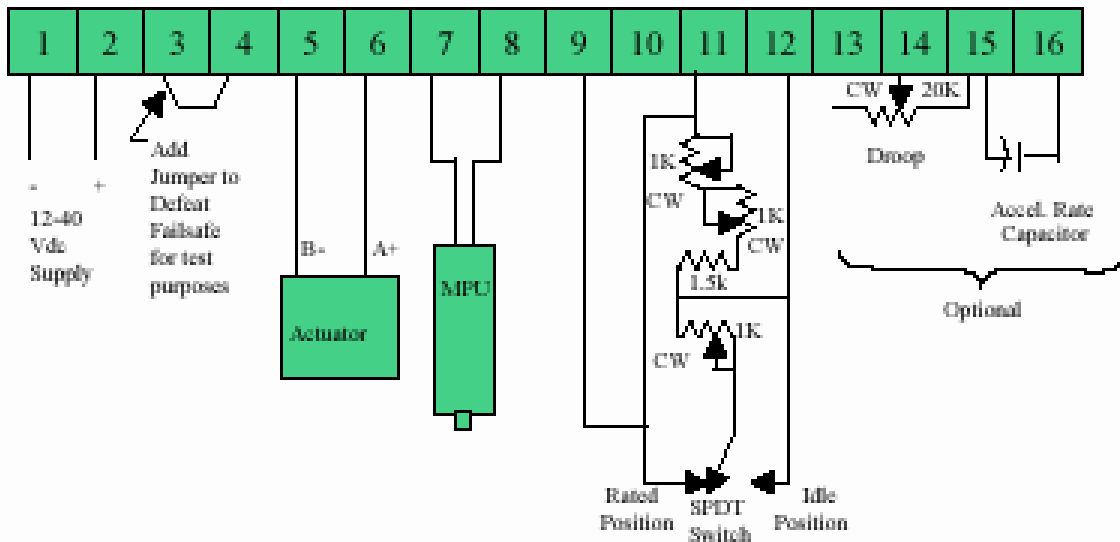


Wiring differences between 8272-689 (4W-5790) and 9907-014 (131-5453) used for standard wiring (fixed speed) speed control:

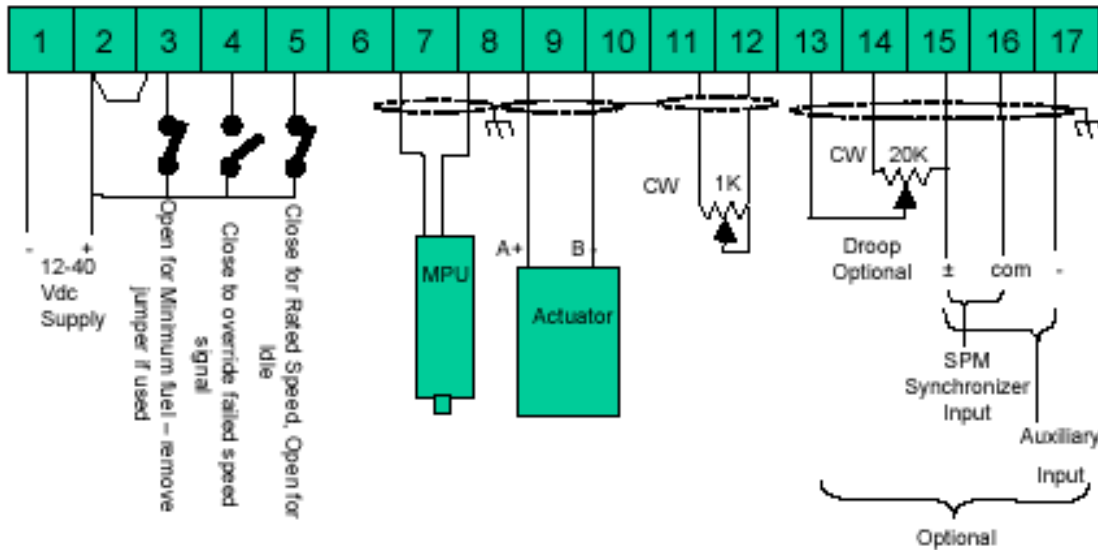
- Actuator connections have moved from terminals 5(-) & 6(+) to terminals 9(+) & 10(-).
- Optional external Accel Rate Capacitor removed—This function is internal and adjusted using the Ramp Time potentiometer on the 9907-014 control.
- Terminals 15 and 16 on 9907-014 control can be used for optional SPM Synchronizer input.
- Terminals 15(+) and 17(-) on the 9907-014 control can be used for optional Auxiliary input.
- Optional external Droop potentiometer slider is moved from terminal 14 to 13, and the clockwise lead is moved from terminal 13 to 14.
- Close for Rated speed and Open for Idle speed contact is moved from terminals 9 & 10 to terminals 2 and 5.

Variable Speed Version

Old Customer Remote Idle and Rated Speed Control 8272-689 (Cat # 4W-5790)
(Variable Speed)



New Customer Remote Rated Speed Control 9907-014 (Cat # 131-5453)
(Variable Speed)



Wiring differences between 8272-689 (4W-5790) and 9907-014 (131-5453) used for Customer Remote Idle and Rated Speed Adjustment:

- Actuator connections have moved from terminals 5(-) & 6(+) to terminals 9(+) & 10(-).
- Optional external Accel. Rate Capacitor removed—This function is internal and adjusted using the Ramp Time potentiometer on the 9907-014 control.
- Terminals 15 and 16 on 9907-014 control can be used for optional SPM Synchronizer input.
- Terminals 15(+) and 17(-) on the 9907-014 control can be used for optional Auxiliary input.

- Optional external Droop potentiometer slider is moved from terminal 14 to 13, and the clockwise lead is moved from terminal 13 to 14.
- If the application used the remote mounted Idle and Rated Potentiometers, the single pole double throw Switch connected to terminals 9, 10 or 11, and 12 should be wired between terminals 2 and 5 on the control (Close for Rated and Open for Idle).
- The Remote Potentiometer Assembly should be replaced by a single 10-turn 1K potentiometer as illustrated.
- Terminal 11 on the control is wired to the CCW lead of the Remote Rated Speed potentiometer.
- Terminal 12 on the control is wired to the CW lead of the Remote Rated Speed potentiometer.

Refer to Woodward manual 82020 for installation, checkout, and setting instructions.

The following procedure is for setting up the Remote Rated Speed Setting potentiometer:

- Install jumper between control terminals 11 and 12.
- Install single-pole double-throw switch between control terminals 2 and 5.
- Adjust Rated Speed potentiometer on the control to produce 1980 rpm.
- Open switch between terminals 2 and 5 on the control.
- Adjust Low Idle Speed potentiometer on the control to 700–1000 rpm range.
- Shut engine down, then remove jumper from terminals 11 and 12.
- Prior to attaching the Remote Rated potentiometer assembly to terminals 11 and 12, rotate the potentiometer to minimum resistance. Attach an ohmmeter to the potentiometer leads to assure less than 5 Ω reading.
- Attach leads from the Remote Rated potentiometer assembly to terminals 11 and 12 on the control as illustrated.
- Put switch in Rated position and verify engine goes to 1980 rpm.
- Adjust Remote Rated potentiometer for 1960 rpm.
- Put switch in Idle position, and verify that engine speed is within the 700–1000 rpm range.

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