

DATE: 25-Jun-2020

TO: Auto Crane Dealers

SUBJECT: GM Chevy 4500-6500 HD Series and International CV Series – Engine Control, PTO Settings and Operation

NOTE: Reference GM UI Bulletin 120f (Power Take Off (PTO) Subsystem Operating Description and Application Guide) which always takes precedent over the information in this dealer bulletin.

Overview

This bulletin describes how to wire the crane control signals to the chassis PTO system to remote start-stop the engine and switch the 2-speed idle. Additional changes to the PTO settings are required to update the default “in-cab” to “remote” mode are detailed. Finally, operation of the PTO system is described.

Chevy PTO System

Chevy chassis has a module mounted on the passenger side at the lower corner of the cam seen below in Figure 1 – PTO Module Location and Figure 2 – PTO Module.

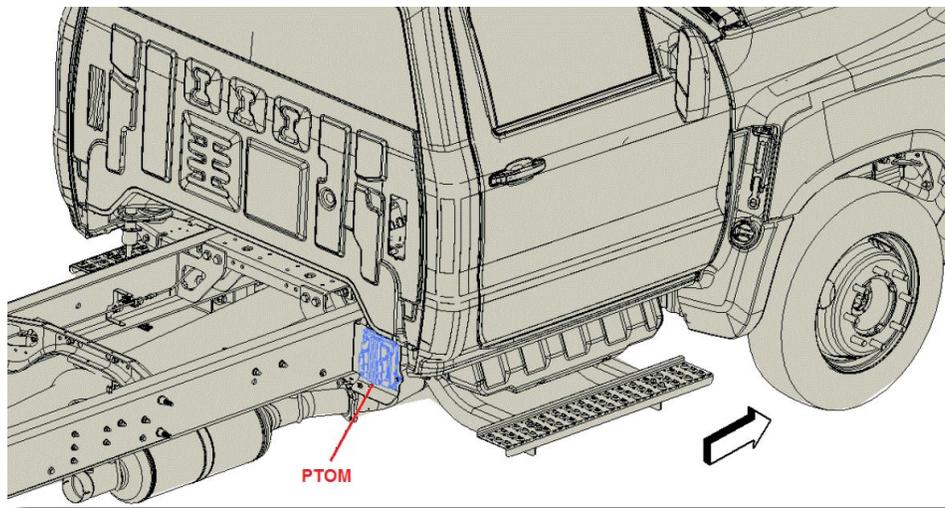


Figure 1 – PTO Module Location



Figure 2 - PTO Module

The X191 connector for interfacing with the PTO module is located just ahead of the right (passenger) rear cab mount. PTO manufacturers provide a replacement mating connector that is pre-wired with some of the signal wires for controlling the PTO.

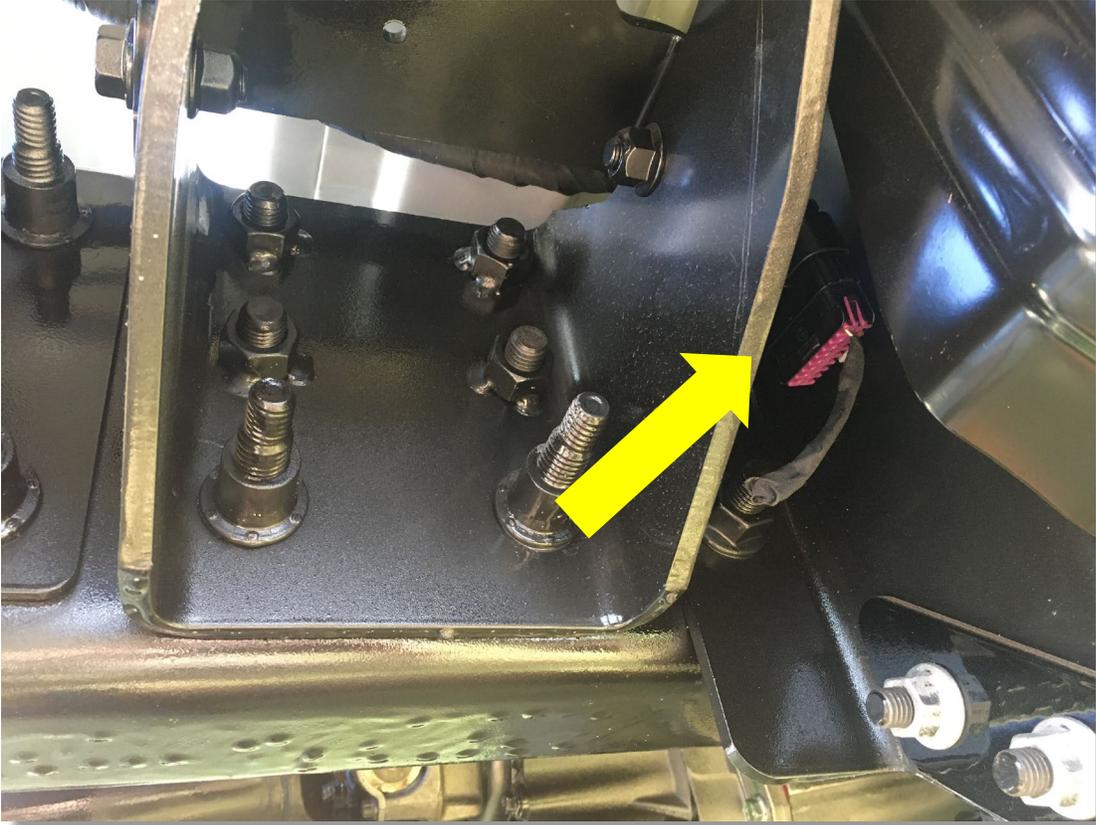


Figure 3 - PTO Interface Connector

Crane Control Wiring Diagram

The following wiring diagram further details connection to relays and the crane start-stop outputs as well as the optional PTO high idle and load feedback. The PTO High Idle relay is optional for 2-speed control.

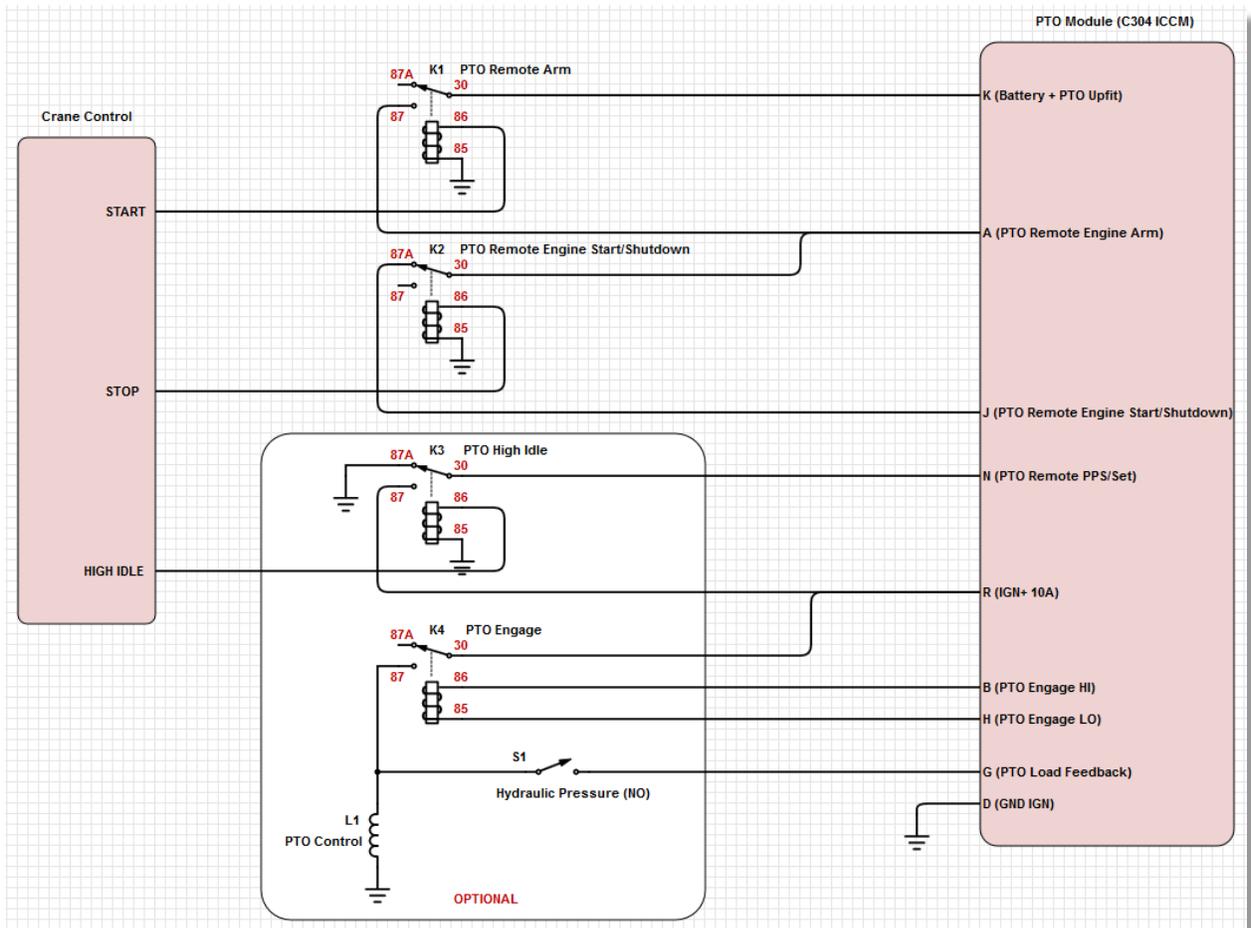


Figure 4 - PTO Wiring

Use change-over relays of type SPDT (1 Form C) with NC/NO contacts. The automotive ISO relay diagram and pinouts are shown below. Note there are two possible pinouts. Terminal 87 in normally open (NO) and 87a is normally closed (NC). Type B is more common.

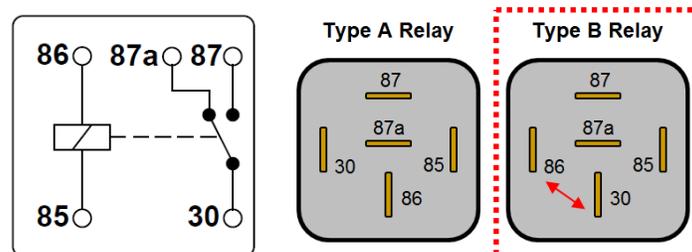


Figure 5 - Change-Over Relay

Chassis Programming

GM offers the GDS2 tool to change the PTO parameters. The tool and software subscription can be purchased from [AC Delco Technical Delivery System](#).

Follow these steps within the GDS2 tool to make changes to the settings:

1. Connect the GDS tool to the chassis using the USB link adapter.
2. Select **Diagnostics**
 - a. Note: You may need to click on **Manage Diagnostic Packages** and select the package if the incorrect chassis is showing.
3. Select the adapter and press **Continue**.
4. Select **Module Diagnostics**.
5. Select **[K44] Power Take-Off Control Module**.
6. Select **Configuration / Reset Functions**.
7. Select **PTO Operation Mode**
 - a. Note: **Parameter name, Control Module, Vehicle Settings, and Setting Changes** need to have values in each column when New Value is selected and saved.
8. Press the down arrow in the **New Value** row.
9. Select **Vehicle Stationary, Preset PTO Speed**
 - a. Note: The Save Changes should have black text after making the selection. If the text is grey (button inactive), select a different value in New Value drop-down list and then re-select Vehicle Stationary, Preset PTO Speed. The Save Changes lettering will turn black when the button is active.
10. Press **Save Changes**.
11. Select **Write Options** to store the new settings in the PTO module.
12. Select **Continue**.
13. Select **PTO Remote Mode Switch** from the **New Value** drop-down menu.
14. Select **Save Changes, Write Options** and **Continue** after all parameters have been set according to the Settings section.
 - a. Note: Procedure Complete appears for reviewing the settings.
 - b. **Important: The GDS software changes the PTO Remote Mode Switch Type from Latching to Momentary without notice. The setting must be changed back to Latching every time after reviewing or making changes to the settings.**

Settings

GM sets the chassis to “in-cab” control by default. The preset idle speeds can be adjusted through the display. However, a number of parameters need to be alternately set by a GM dealer to enable “remote” mode as noted below.

Parameter	Setting
PTO Operation Mode	Vehicle stationary, Preset PTO Speed
PTO Control	PTO Remote Mode Switch
PTO On to Set 1 Speed	Enabled
PTO Standby Speed	900 rpm min preset, set to minimum working speed (1500 rpm max)
PTO Speed 1	1200 rpm preset (1100 rpm min), <i>only required for 2-speed operation</i>
PTO Speed 2	1900 rpm preset (1700 rpm min)
PTO Engine Shut-Down	Enabled
PTO Remote Engine Start Status	Enabled
PTO Remote Mode Switch Type	Latching
Default Input Signal Definition of Remote Mode Switch	Standby Speed
Low Input Signal Definition of Remote Mode Switch	Set 1 Speed (if 2-speed) otherwise Standby Speed
High Input Signal Definition of Remote Mode Switch	Standby Speed
Remote PTO In-Cab Control Enabled – Remote In-Cab Initiate	Disabled

Operation

Preset PTO - Remote Operation

Enable Conditions [requires programming with GM service tool and installation of engine start and stop signals from crane control].

1. Cruise Control must be OFF (confirm this is OFF before powering-down the vehicle with the Ignition key).
2. The shift lever must be in PARK [P].
3. The park brake must be set and the hood must be closed.
4. The engine must be stopped and the Ignition key removed. Vehicle can be locked if desired.
5. From the crane remote, momentarily toggle the Engine Start switch (activates PTO Remote Arm relay).
6. Within 5 seconds, momentarily toggle the Engine Stop switch (activates PTO Remote Engine Start/Shutdown relay).
7. The vehicle horn will chirp 3 times, and then engine starting will automatically be initiated. The PTO system will then elevate engine rpm to PTO Standby Speed and engage the PTO Load relay.
8. The crane remote High Idle switch can now be used to accomplish the PTO Set 1 and Set 2 Engine speeds (if 2-speed relay installed). Note: The accelerator pedal is disabled when remote PTO operation is selected.

Notes

- The analogy GM uses for the remote start sequence is a keyed ignition switch. Insert the key, turn the key to “start” and release to “run”. Thus the engine start sequence using the crane remote is to first toggle Engine Start, then toggle Engine Stop to initiate the truck start operation.
- The PTO load relay engages immediately when the PTO operation is initiated by the switch input. This produces a soft engagement because the transmission torque converter is unlocked. The torque converter will lock upon reaching stable PTO Standby Speed [default = 900 rpm] so maximum power is available.
- The first elevated engine speed – PTO Standby Speed is not intended as a working speed but as a verification that the system is active and ready to go to a working speed. PTO Standby Speed can be modified to a ‘working speed’ with a GM Service Tool. The upper limit for PTO Standby Speed is 1500 rpm.
- The remote switches and relay connections are made at the PTO Upfitter Connector located on the chassis frame behind the cab.
- The PTO Control setting on the Service Tool must be programmed to “Remote PTO Mode Switch” before the remote switches can be used.
- The PTO relay is programmed to be enabled in the factory default settings.
- The PTO will not operate with an open hood.
- Stationary Remote Mode is not intended to be operated with the ignition key in place.

Auto Crane

PTO and Pump Options

GM uses the Allison 2700 transmission on this chassis.

Always work with your PTO and pump dealer to verify the correct parts for your specific chassis.

For questions or concerns please contact Auto Crane's customer service group at 800.777.2760 or 918.438.2760.