




<b>TITLE:</b>  Hand Throttle Installation & Safety Guide	<b>REVISION DATE:</b> 1/20/2024	<b>ORIGINAL ISSUE DATE:</b> 8/7/2022
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## 1.0 General

1.1 This document encompasses all GP Diesel billet hand throttles. Images may be generic but do adequately represent all GP Diesel billet hand throttles. If there is an installation and safety guide for a unique hand throttle, the document title will be listed below.

1.1.1 Currently there are no unique hand throttles that required a unique installation and safety guide.

## 2.0 Before Use Safety

2.1  Failure to conduct the safety inspections explained herein before every use and failure to properly address known issues, potential issues, or concerns of any kind may result in but not limited to erratic engine speed, unexpected and or unintended vehicle movement, complete loss of control, serious injury or death of occupants within and or in the vicinity and or path of the vehicle.

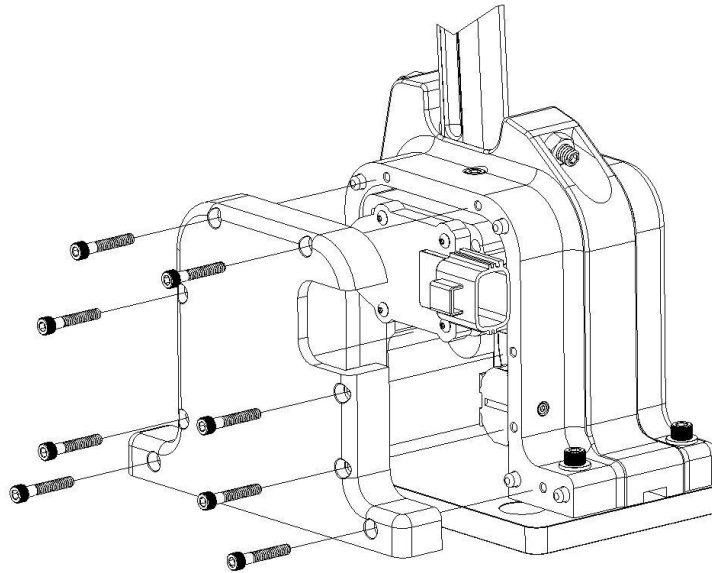
2.2 Any issues, potential issues, or concerns of any kind identified during a safety inspection must be properly addressed before the vehicle's ignition key is placed in any position other than off and or starting. Do not start and or operate the vehicle if there is any question or concern regarding the condition of or the ability of the hand throttle to operator with the intent of its design.

### 2.3 **Internal** safety inspection

2.3.1 Remove housing cover and inspect all components for signs of wear such as but not limited to metal dust or shavings, plastic dust or shavings, broken or cracked springs, loose components and fasteners.



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#### 2.3.1.1

2.3.2 Inspect for excessive rust, oxidation, or corrosion. Rust, oxidation, or corrosion of components such as springs may result in but no limited to binding, cracks, and or broken springs.

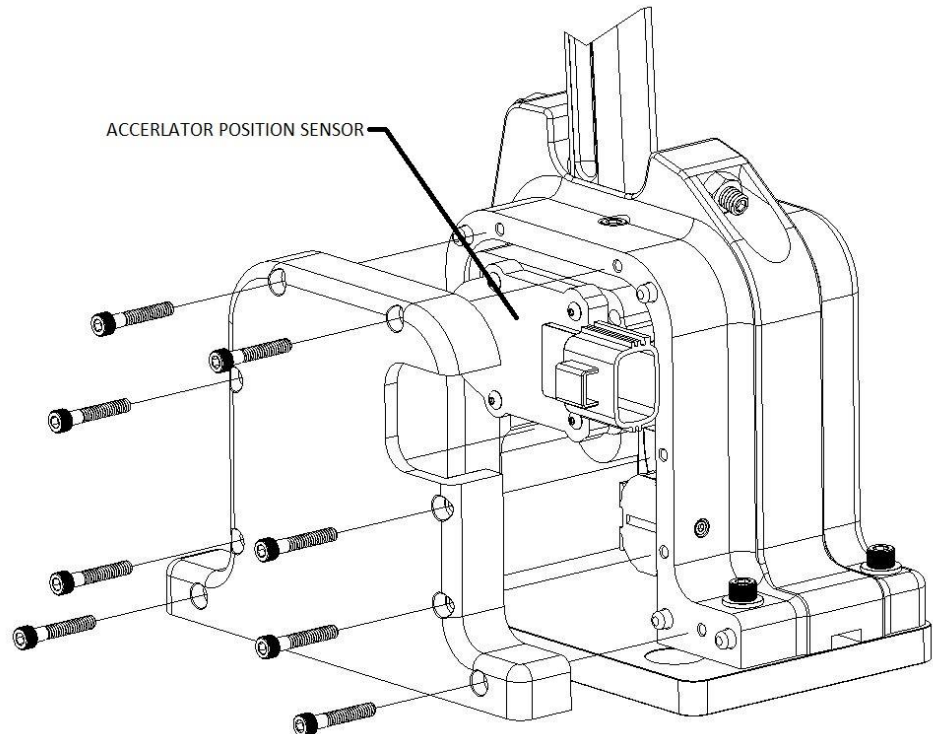
2.4 Ensure all electrical wires are securely connected to the terminal block that was designed for the hand throttle. Loose or disconnected wires may cause erratic and unexpected activation of external loads connected to the terminal block. For details about how the terminal block works, reference section titled Installation – Pushbutton Wiring.

2.4.1 Example: In this example, the external load is a manual torque converter lockup switch. If the vehicle is in gear and an erratic and unexpected electrical signal activates the load and locks the torque converter, it likely will result in the vehicle lurching which may result in serious injury or death and or damage to vehicle drivetrain components and systems.

2.4.2 Ensure that the accelerator position sensor is securely fastened and not loose.



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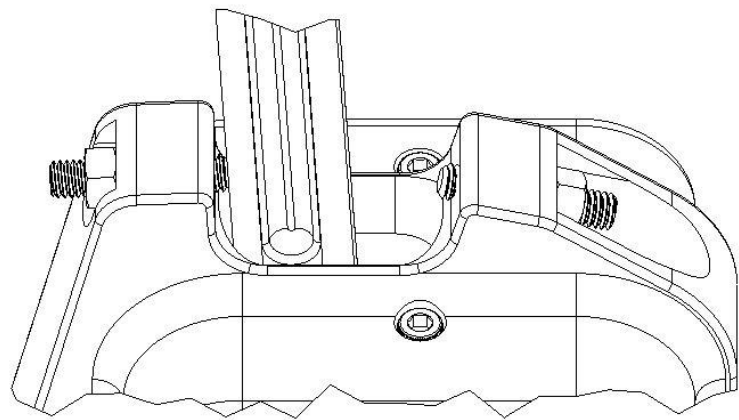
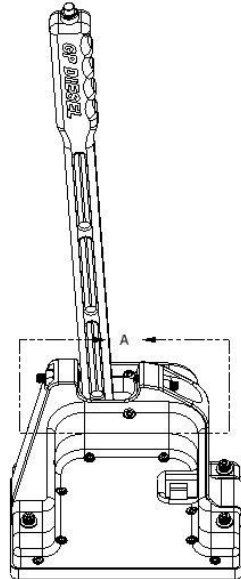


#### 2.4.2.1

- 2.5 Inspect the slot/hole in the housing body where the handle passes through for gulling, rubbing, or wear. Rubbing of the handle against the housing may produce excessive wear, metal dust and shavings, and gulling which may result in seizing or cold welding of the handle to the housing. Seizing or cold welding of the handle to the housing may result in loss of control. The slot/hole must be free of all debris. The environment which the hand throttle is used in must be kept clean and free of loose debris/articles that may potentially ingress between the handle and housing. Debris between the handle and the housing may prevent the handle from returning completely and not allow the engine to return to idle.



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DETAIL A  
SCALE 2 : 1

2.5.1

## 2.6 External Handle Stops Safety Inspection

2.6.1 The external handle stops come pre-set and should not require any adjustment. The only time the handle stops may need adjusted is if they become loose, damaged, or if the handle wears excessively where the handle contacts the hard stop.

2.6.2 The handle stops must be tightly secured. Loose handle stops will allow the handle start (idle) and end (WOT) positions to unknowingly change resulting accelerator position sensor damage, engine speed changes, and potentially loss of vehicle control. Reference the [Adjusting Handle Stops](#) section within this document regarding handle stops adjustment.

## 2.7 External Inspection

2.7.1 The vehicle's wire harness, connected to the hand throttle's accelerator position sensor, must be appropriately and securely connected.

2.7.2 The hand throttle must be securely mounted to the provided mounting plate and the mounting plate securely mounted to the truck. Reference the installation sections within this document for details about installing the mounting plate.



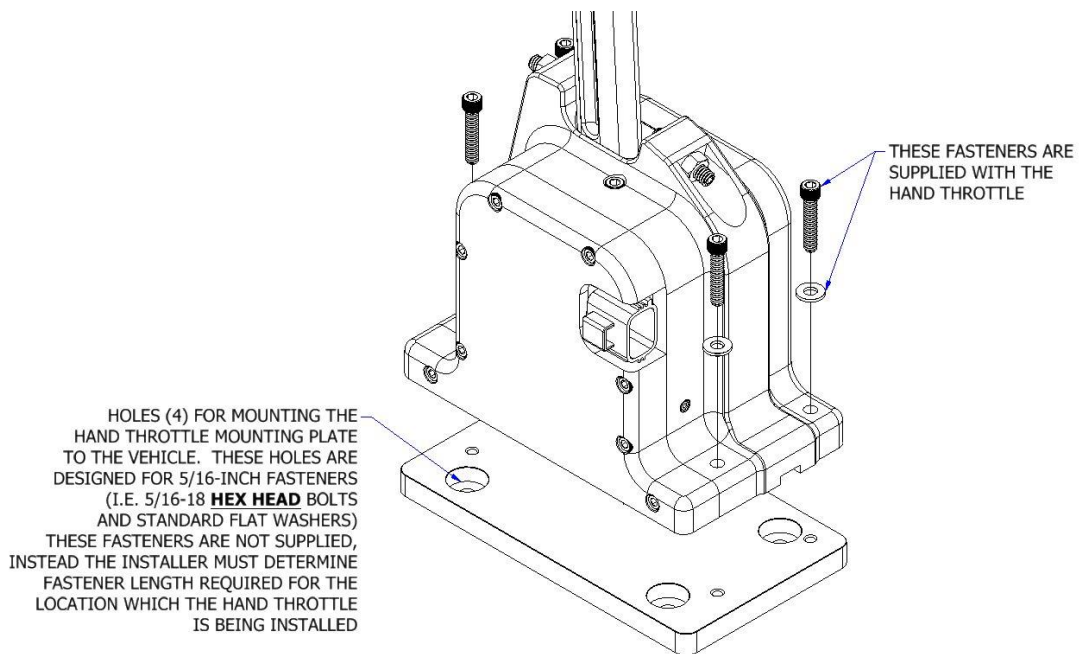
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2.7.3 The environment which the hand throttle is used in must be kept clean and free of loose debris, loose articles of any kind that may potentially ingress into the hand throttle housing, get caught on or hit the handle of the hand throttle. Loose articles within the vehicle may shift, move, or become airborne within the vehicle and may strike the handle which will cause unintended and or unexpected engine speed and or loss of control of the vehicle. Inspect the surrounding environment and remove any loose articles before placing the ignition key in any position other than off.

2.8 The hand throttle is not water resistant or waterproof. Water ingress into hand throttle handle or housing may lead to electrocution resulting in vehicle damage, complete loss of vehicle control, serious injury or death of those in the vehicle or within the vicinity of the vehicle. If water ingresses into the hand throttle, the accelerator position sensor must be replaced – if this is so, please contact GP Diesel to have a quick discussion about the replacement for suggested tips.

### 3.0 Installation – The Mounting Plate

3.1 The mounting plate is designed to be mounted with Ø5/16-inch hex head bolts and washers.



3.1.1



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- 3.2 Determine the location that feels comfortable. The structure which the mounting plate is being fastened to must be strong, stable, and in good condition. Do not fasten the mounting plate, for example, to a thin rusty sheet metal which has a risk of breaking apart/off resulting in a hand throttle that is no longer securely mounted. Before installing the mounting plate and hand throttle, make sure there is enough clearance between the handle and the dash when the hand throttle is in the WOT position.
- 3.3 Drill holes through the structure which the mounting plate is to be installed.
  - 3.3.1 Before drilling, inspect the area to ensure the drill bit does not hit and damage something critical, resulting vehicle malfunction and or serious injury or death.
- 3.4 If the mounting plate is being installed on an uneven surface, shim the plate level with washers. The mounting plate bolts must go through the inside diameter (ID) of the washers.
- 3.5 Securely bolt the mounting plate to the structure. **A locknut must be used to secure the mounting plate bolts.**

#### 4.0 Installation – The Hand Throttle

- 4.1 With the mounting plate secure, fasten the hand throttle to the mounting plate with the supplied hardware. Apply medium strength thread locker to the threads of each bolt before installing.

#### 5.0 Installation – Pushbutton Wiring

- 5.1 This section is not applicable if the pushbutton is not going to be used.
- 5.2 Disconnect the battery cables from the battery/batteries
- 5.3 The pushbutton comes prewired into the top terminals (1, 2, 5, 6) of the preinstalled terminal block reference diagram within this section; one wire connected to each of the two available circuits of the terminal block. Each circuit has four terminals (two on top, two on bottom). All four terminals of each circuit are connected.
- 5.4 Before wiring an external load to the terminal block, review the electrical ratings shown below and ensure that the external load will not exceed them.



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<b>Standard Characteristics/Ratings:</b>		
<b>ELECTRICAL RATINGS:</b>		
<b>Load</b>	<b>Sea Level @ 28VDC or 115VAC, 60/400Hz</b>	<b>50,000 feet @ 28VDC or 115VAC, 60/400Hz</b>
Resistive	10A	N/A
Inductive	5A	5A
Lamp	3A	N/A
Motor	3A	N/A
Center Contact	3A max	N/A
DWV	1050Vrms	400Vrms
Low Level	10mA @ 30mV max DC or peak AC	

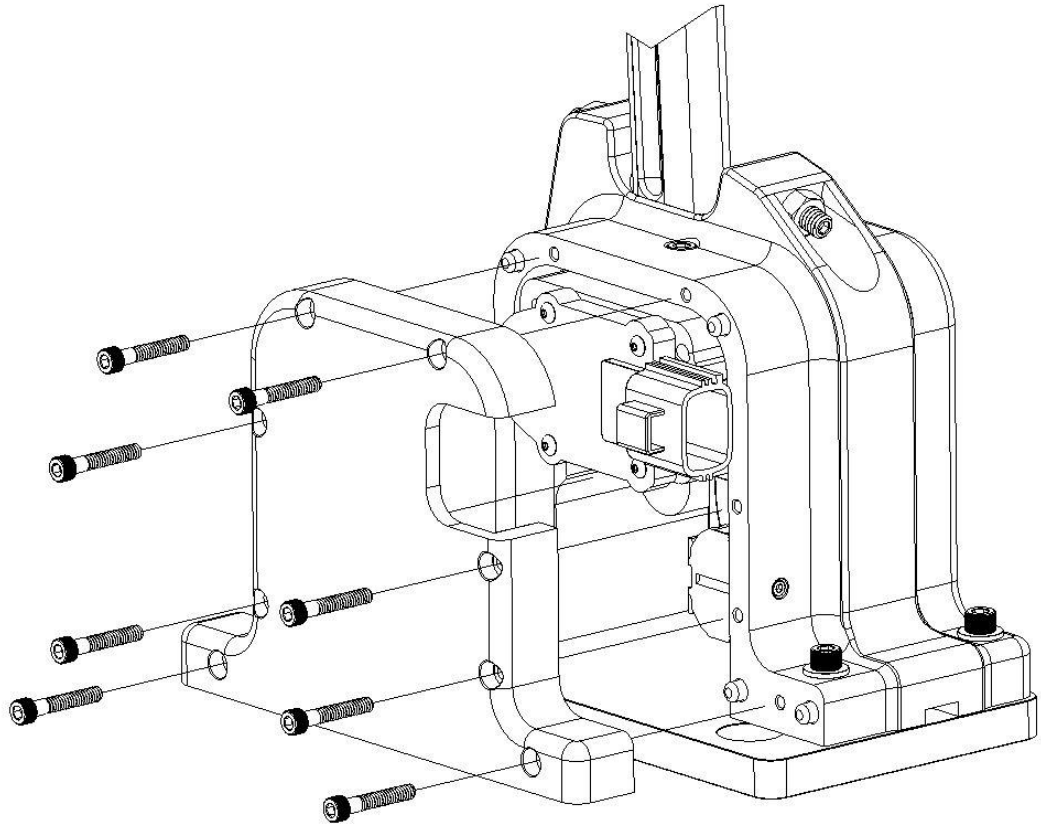
5.4.1

5.5 Remove the housing cover, ref. image below. The housing cover is precisely located by slip fit dowel pins, so the cover must be pulled off straight or it may bind on the dowels making it difficult to remove. The dowel pins keep the parting line of two housing covers matched up for a quality fit and appearance.





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5.5.1

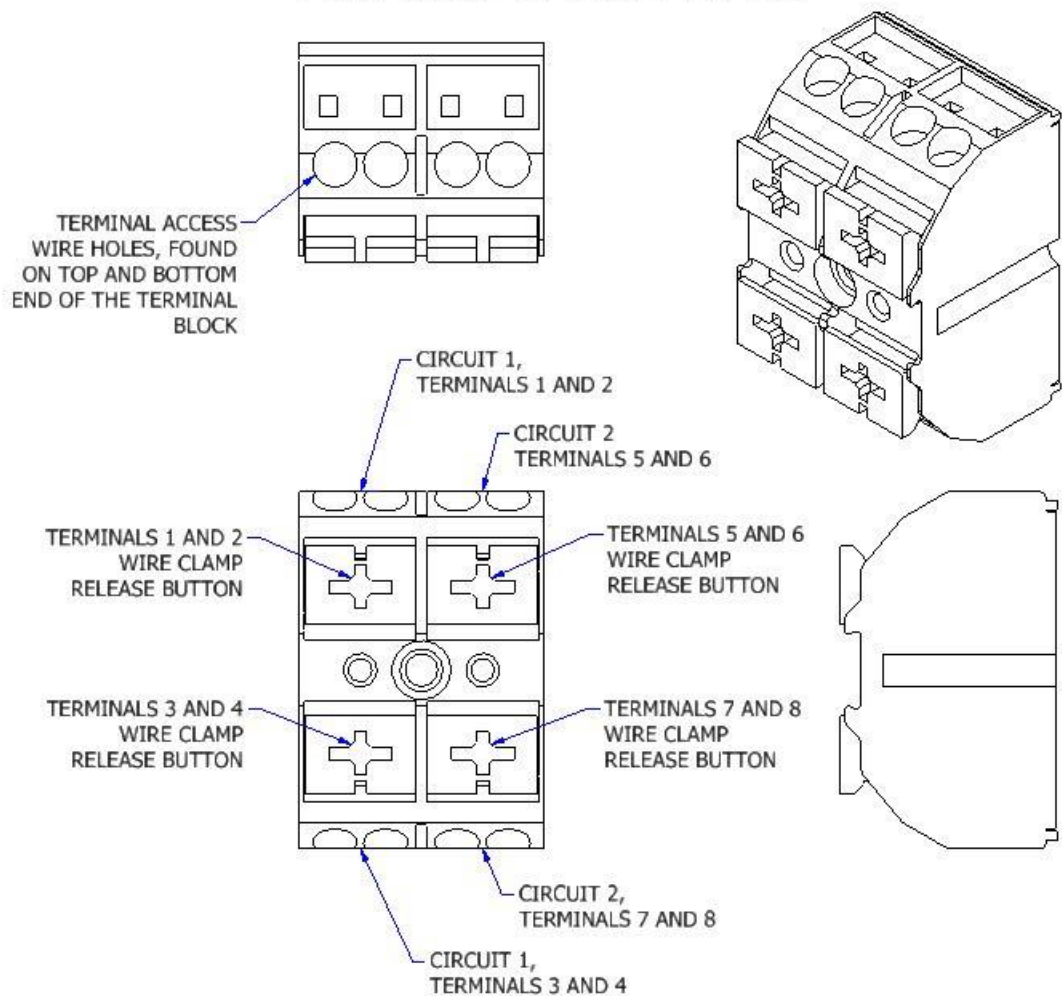




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### 5.6 Terminal Block Description/Operation Diagram

FOR WIRE GAUGE: 20-12



#### 5.6.1

5.7 The two wires from an external load must be wired into the bottom of the terminal block.

5.8 Strip the insulation from the end of one wire and twist it as shown in the image below; strip only the minimum amount to required to make a secure connection in the terminal block. One the side of the terminal block, the terminal block manufacturer shows a depiction of a stripped wire, recommending to strip 1mm (0.433in) of the insulation off.



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5.8.1



- 5.9 Press a wire clamp release button to open the terminal wire spring clamp and insert the wire's stripped end and release the button; repeat for remaining wire(s).
- 5.10 Ensure the wire is securely clamped in the terminal; repeat for remaining wire(s).
- 5.11 Issues that may occur but not limited to when inserting a wire into the terminal block:
- 5.11.1 **Stripped wire end not inserted into the terminal far enough** to be clamped by the wire spring clamp within the terminal block. With the wire spring clamp fully open, the wire should easily insert into the terminal. If having trouble inserting the wire into the terminal, do not force the wire into it, this may bend back strands of the wire so that all strands are not clamped by the terminal spring clamp. Remove the wire, retwist the stripped end, then try to install it into the terminal again.
- 5.11.2 **The wire end is not stripped far enough** resulting in the wire insulation to be in the wire spring clamp instead of the twisted copper wire strands.
- 5.12 Once the external load is properly connected to the terminal block and all other electrical connections are complete, reconnect the battery cables to the battery/batteries.

6.0 Adjusting Handle Stops

- 6.1 Stops are set by GP Diesel and calibrated with a scanner to match the signal which an OEM accelerator pedal generates. Adjusting the stops without the ability to monitor/data log the accelerator position output signal may result in the pedal needing to be returned to GP Diesel for calibration. The only time handle stops may need adjusted is:
- 6.1.1 Unintentional loosening of a stop resulting in position change.
- 6.1.2 User wants to limit engine power by limiting wide-open-throttle position.
- 6.2 It is highly recommended to use a scanner, for example HP Tuners VCM Scanner, to monitor accelerator pedal position while adjusting the handle stop with the key-on-engine-off.
- 6.3 **If the handle stops are adjusted by the end user, it is highly recommended that accelerator pedal position be data logged to ensure the desired outcome is achieved.**



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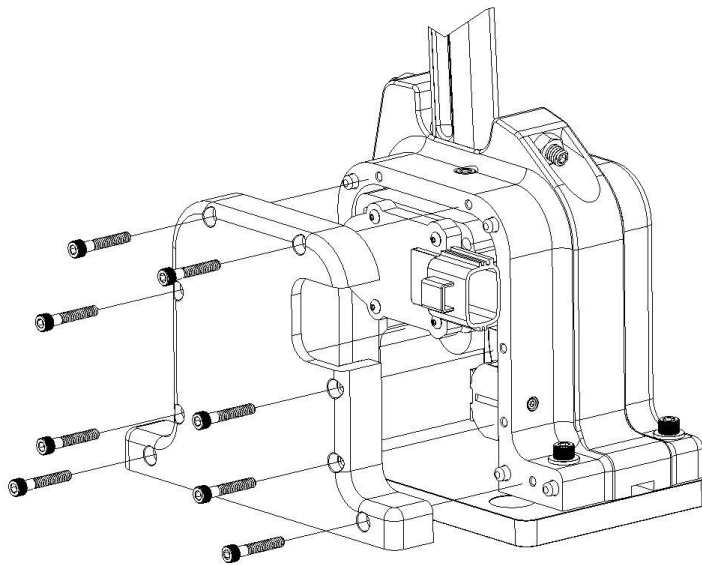
6.4 If a handle stop is adjusted too far below idle it may allow the handle to move too far, damaging the sensor.

## 7.0 Wide Option Throttle Switch (WOT) (a purchased option)

### 7.1 Wiring the WOT Switch

7.1.1 Turn the vehicle off and disconnect the battery cables from the battery/batteries.

7.1.2 Remove the housing cover, ref. image below. The housing cover is precisely located by slip fit dowel pins, so the cover must be pulled off straight or it may bind on the dowels making it difficult to remove. The dowel pins keep the parting line of two housing covers matched up for a quality fit and appearance.

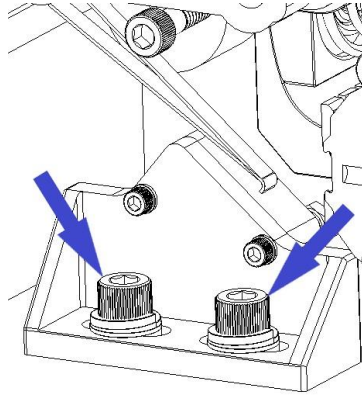


7.1.3

7.1.4 Loosen the two bolts holding the WOT switch bracket and remove the WOT and bracket assembly from the housing (the switch does not need removed from the bracket).

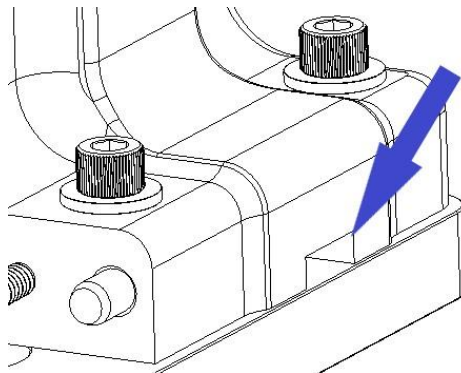


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7.1.4.1

- 7.1.5 Run the wires through the wire slot in the housing. The wire slot edges have been deburred, but you must ensure the wires are appropriately protected from chaffing or any other damage.



7.1.5.1

- 7.1.6 Do not run the WOT switch wires to the terminal block that is integrated into the hand throttle, which is used for the pushbutton located in the top of the handle grip. This is only permitted if the push button wires are removed from the terminal block, capped, and secured out of the way of moving components within the hand throttle housing.
- 7.1.7 Attach appropriate wire end connectors, designed for the WOT switch, and connect them to the WOT switch. Make sure the wires are securely attached to the WOT switch and will not come loose or fall off due to extreme vibration or abrupt changes in motion – do not use if not confident in the wire connections to the WOT switch.



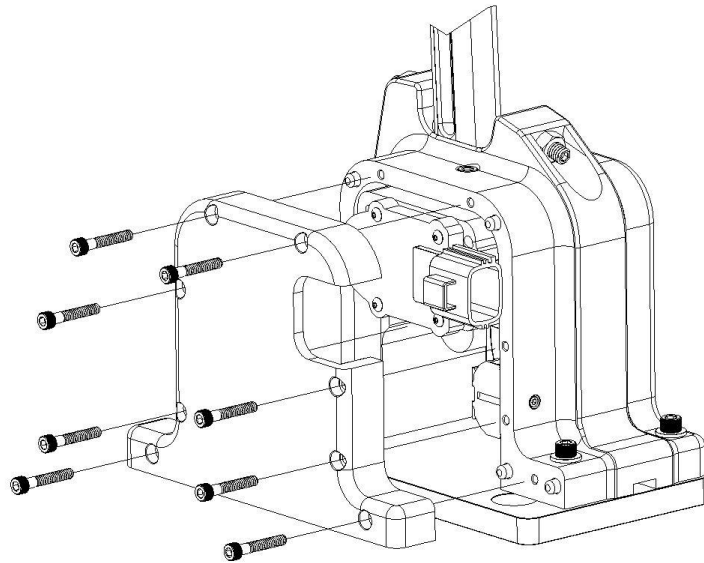
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7.1.8 Reinstall the WOT switch and mounting bracket; adjust its position before installing the housing cover – refer to the Adjusting the WOT Switch section.

## 7.2 Adjusting the WOT Switch

7.2.1 Disconnect the battery cables from the battery/batteries

7.2.2 Remove the housing cover, ref. image below. The housing cover is precisely located by slip fit dowel pins, so the cover must be pulled off straight or it may bind on the dowels making it difficult to remove. The dowel pins keep the parting line of two housing covers matched up for a quality fit and appearance.



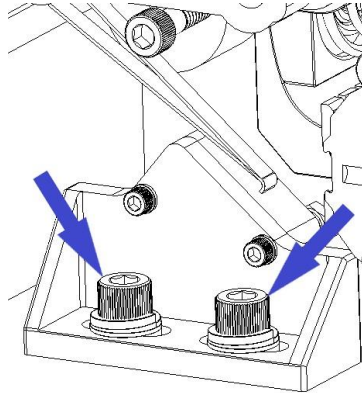
7.2.3

7.2.4 Mark or measure the location of the WOT switch bracket before making an adjustment.

7.2.5 Loosen the two bolts holding the WOT switch bracket enough to allow it to move side-to-side.

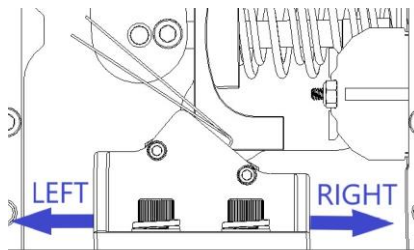


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7.2.5.1

- 7.2.6 Slide the bracket to a new position and hand tight the fasteners to hold it in place. Moving the bracket to the right activates/makes the switch closer to the hand throttle’s idle position. Moving the bracket to the left activates/makes the switch closer to the hand throttle’s WOT position.



7.2.6.1

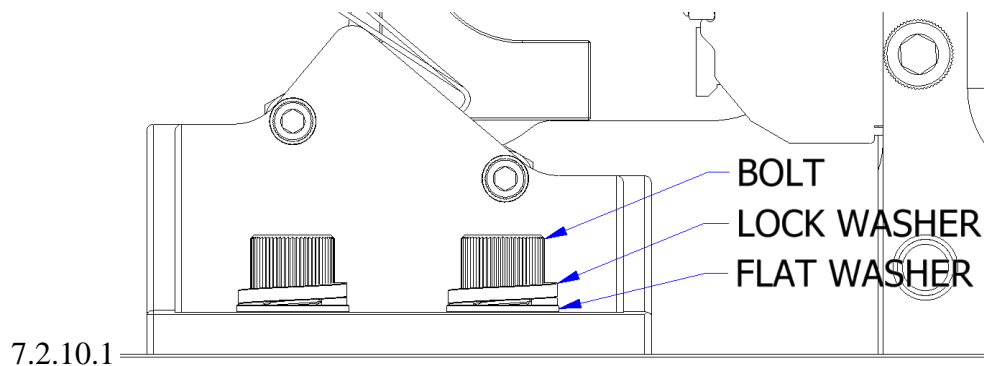
- 7.2.7 Actuate the hand throttle while watching the WOT switch and listening for the audible “click” sound from the WOT switch. Repeat as necessary, making only small position adjustments until the desired switch activation timing is achieved.
- 7.2.8 The WOT switch can be positioned in a way that activates/makes the switch connection very early in throttle position (close to idle state), so be very careful, aware, and confident in the understanding of the results from such a switch position/timing.
- 7.2.9 Once the desired WOT switch position/timing is achieved, tighten the bolts – do not overtighten, the WOT switch mounting bracket could be damaged. Once tightened, try to push the bracket side-to-side to ensure the bracket is secure and does not move.





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7.2.10 Make sure the lock washers provided with the hand throttle are always in place and in the appropriate position (ref. image below). The lock washers prevent the bracket fasteners from loosening due to extreme vibration or abrupt changes in motion. Unexpected movement in the bracket may result in unexpected vehicle motion, operation, and/or complete loss of control resulting in injury or death of anyone within or around the vehicle.



7.2.11 Reinstall the housing cover.

## 8.0 Preventative Maintenance

8.1 None

## 9.0 Document Revisions

9.1 Rev A – 8/7/2022

9.1.1 Created

9.2 Rev B – 1/10/2024

9.2.1 Added Document Revisions section.

9.2.2 Added instructions for the new option of a WOT switch.

9.2.3 Title was 6.0 & 6.4 Powerstroke Hand Throttle Installation & Safety Guide; title is Hand Throttle Installation & Safety Guide. This change was made to accommodate hand throttles for other vehicle applications (e.g., Powerstroke, Cummins, Duramax)





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9.3 Rev C – 1/20/2024

- 9.3.1 File name was 6.0 & 6.4 Powerstroke Hand Throttle Instructions, is GP Diesel Billet Hand Throttle Instructions. Added section 1.0 before section 2.0 Before Use Safety.
- 9.3.2 In the pushbutton wiring section, added a sentence stating the terminal block manufacturers recommended wire strip length.