

**check » shift » accelerate » park**

**Markets**

TRUCK



BUS



CONSTRUCTION



AGRICULTURE



MILITARY



**Products**

PARK BRAKE SYSTEMS



MECHANICAL CONTROL CABLES



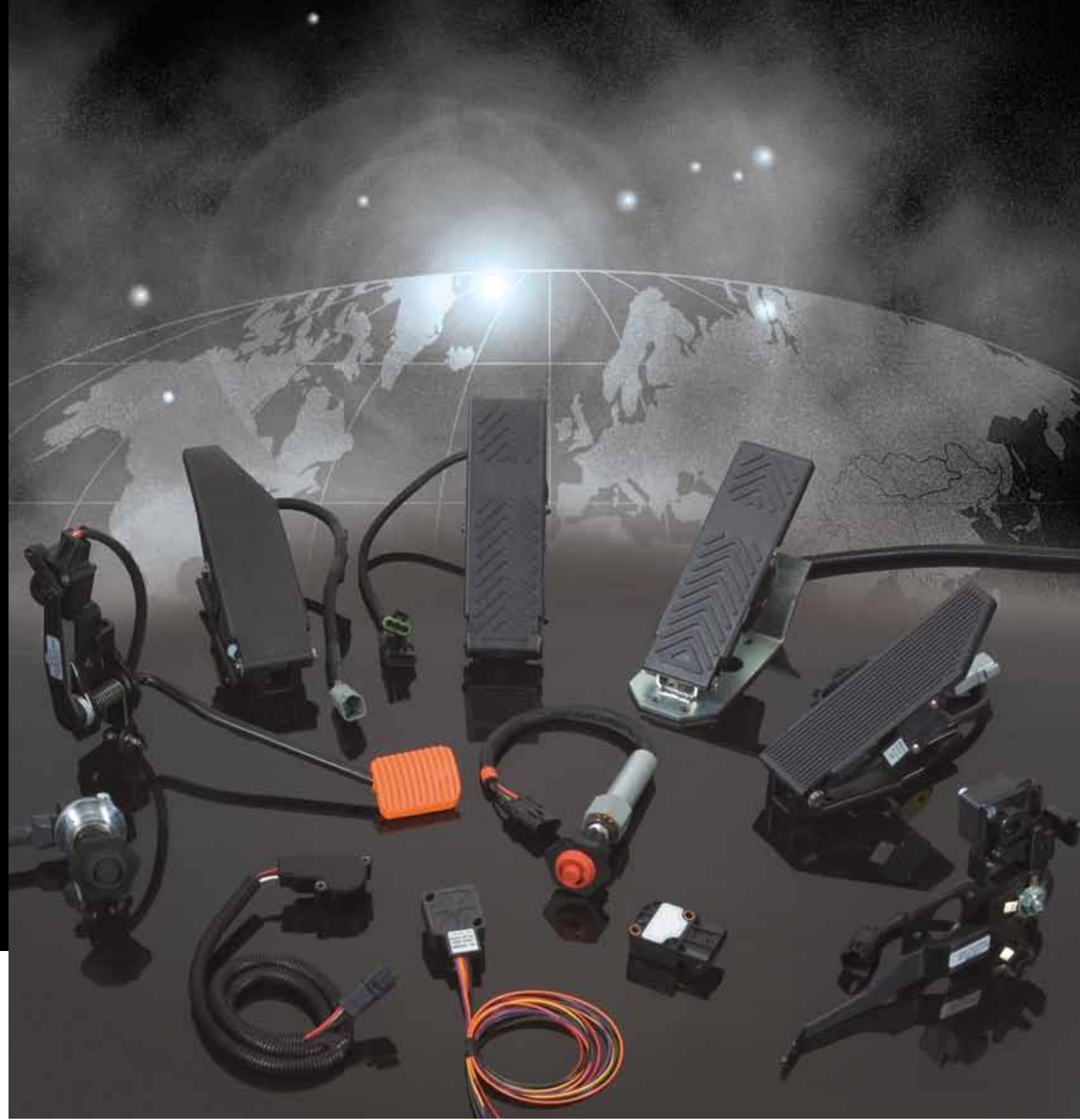
FLUID LEVEL INDICATORS



ELECTRONIC THROTTLE CONTROL SYSTEMS



SHIFT CONTROL SYSTEMS



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Specifications subject to change without notice.

**Electronic Throttle Control Systems**



**ORSCHELN®**



ISO 9001 : 2000

ETCSCAT0709



# ORSCHELN®

Electronic Throttle Control Systems  
[www.orschelnproducts.com](http://www.orschelnproducts.com)

## Orscheln is a global supplier offering a broad range of motion control products and systems to the heavy-duty vehicle marketplace.

Orscheln Electronic Throttle Control Systems (ETCS) are designed with the end user in mind, to deliver a precision signal that interacts with the engine's electronic fuel management systems and to provide smooth responsive interface with the operator.

Orscheln ETCS are designed to work in a wide variety of applications from on-highway trucks and buses, off-highway agricultural and construction equipment to a wide range of specialty vehicle uses.

- Trucks
- Buses
- Vans
- Stationary Equipment
- CNG
- Hybrid
- Military
- Construction
- Agriculture



### Orscheln supports global customers

- Dedicated design and application engineering support team
- Manufacturing in North America and Europe

### Validation and durability testing include:

- FMVSS
- Electrical Sequence
- EMI
- Vibration
- Temperature Cycle
- Dust Ingress
- Humidity
- Chemical Resistance
- Water Ingress
- Salt Spray
- Handling Shock
- Endurance

100% end-of-line testing on all throttle assemblies with electronic footprint recorded.

## Sensor Technology

Orscheln ETCS are available in a wide variety of configurations to meet the customer's and end user's exact requirements. It starts with understanding the engine's electronic fuel management systems.

Orscheln works closely with customers to develop sensor technology to meet the specific application requirements. Both non-contact and contacting technology are applied.

Sensor outputs available include Ascendent, Descendent, A+D, Dual Output (A+ Half A), P.W.M., Signals+Switch.



## Floor Mounted

Floor mounted foot pedal assemblies are available in all polymer and a combination of polymer and steel materials.

- Lightweight
- Robust/Durable design
- Corrosion-resistant
- Complies with FMVSS-124
- Various pedal angles
- Various connector options and harness lengths



## Suspended

The suspended pedals are designed for ease of installation and flexibility for ergonomic positioning. Adaptable designs incorporate all polymer or polymer/steel.

- Lightweight
- Robust/Durable design
- Corrosion-resistant
- Complies with FMVSS-124
- Fire wall mount
- Various pedal rotation angles
- Various connector options and harness lengths



## Hand Throttle

Hand throttles are designed for use with electronic engines to allow hand control of the engine.

- In-cab location
- Remote location
- Easy to operate
- Precise control of engine
- Quick shut-down feature available

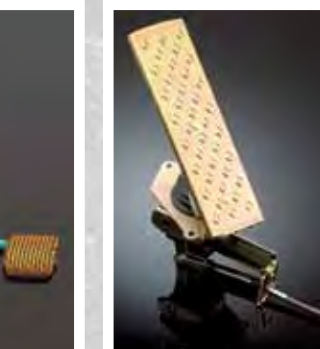
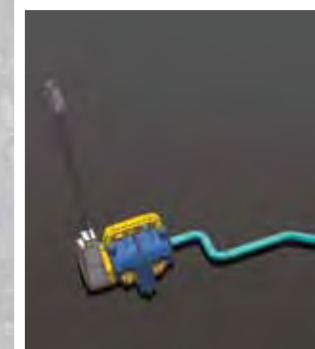
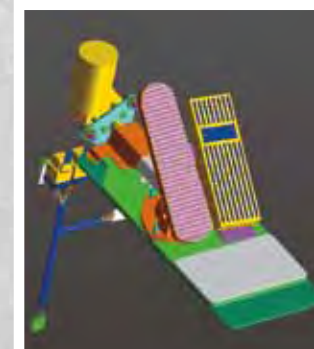


## Custom Designs

Orscheln ETCS are available in custom designs to meet the customer's ergonomic, mounting and space envelope requirements. Mechanical and electromechanical are available.

Application support can provide:

- Design
- Development
- Validation



# The Global Leaders

## in motion control systems.

This catalog includes Felsted's engine, valve, and pump controls. For more than 25 years, Felsted has produced hand and foot controls for the on-highway and off-highway heavy-duty markets. Most controls in this catalog continue to utilize mechanical control cables which we produce for both OEM and aftermarket needs. In addition, we have designed foot pedals and hand vernier controls for the new generation of electronic controlled diesel engines.



**FELSTED®**

*Above: Floor mount throttle pedals for electronic engines.  
Right photo: Prototype concepts of suspended pedals.*

### Engine Controls

Felsted designs and manufactures floor throttle pedals for both mechanical and electronic governed engines. Our rugged steel mechanical pedal on pages 5-6 is used on various on and off highway equipment. (See Felsted HP Cable catalog for throttle and vernier control cables.) For the new electronic controlled diesels, see page 2 for our standard floor pedals. Suspended style throttle pedals are unique to each OEM application.

Please consult the factory for the latest specifications.

New generation vehicles are demanding more reliable electronics, lightweight materials, and corrosion resistant materials. Long life sensors and molded polymers are used to provide lightweight and durable performance.

### Valve and pump controls

Hand levers to remotely operate spool valves are on page 7, and companion Heavy-Duty levers are on pages 9-10. These cable controlled levers provide rugged operation and flexibility for remote location.

For PTO and hoist controls on dump trucks, see pages 11-12 and 13-14. Felsted offers both "T" handle and side push button styles.

## Catalog Index

Floor Pedal for Electronic Engines .....	2
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Dump Body Controls — T-Handle .....	13-14

## Electronic Foot Pedal for Heavy-Duty Electronic Diesel Engines

The foot pedal delivers a precision signal that interacts with the engine's electronic fuel management systems. Polymer components create a lightweight pedal, as much as half the weight of current pedals in the marketplace. This fast-reacting pedal provides smooth driver operation, and features a durable, longer-life potentiometer. Quality testing ensures reliability and durability.



### Specifications for Electronic Foot Pedal

#### Functional

Actuation Force applied perpendicular to the treadle surface and at a point 7.4 inches (188 mm) from centerline of the pivot axis.

Initial Movement > 2 lbs. (9 N)  
 Full Throttle < 11.5 lbs. (51 N)  
 Rotational Angle 16-20°

#### Weight

Weight of Pedal 1.9 lbs. (.86 Kg)

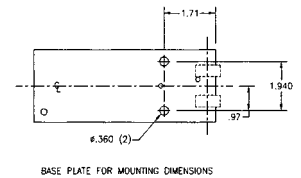
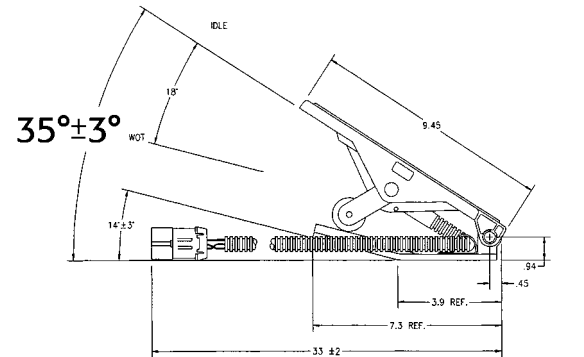
#### Durability

Full Stroke Cycles 10 Million  
 Dither Cycles ±1 Degree, Mid Range 80 Million

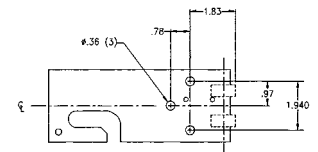
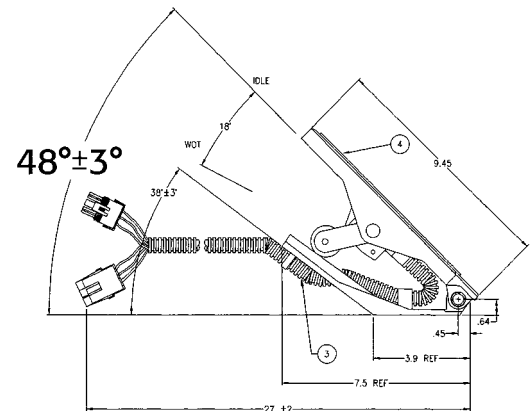
#### Electrical Specifications

Potentiometer 2.5 k ±15% Ohm's  
 Maximum Voltage 13.5 Vdc  
 Power Rating 0.15 W @ 85° C  
 Max continuous current 20 mA  
 \*Minimum output 0.5% ±0.5% of ref. V.  
 \*Maximum output 93% ±2% of ref. V.

\*Minimum and Maximum outputs controlled by mechanical assembly of pedal.



BASE PLATE FOR MOUNTING DIMENSIONS



PARTIAL VIEW OF BOTTOM FOR MOUNTING DIMENSIONS

Electronic Pedal Product Numbers	Standard Models	*35° Pedal Angle	48° Pedal Angle
Caterpillar		EFP107-00	EFP102-00
Cummins		EFP108-00	EFP103-00
Detroit Diesel		EFP109-00	EFP104-00
Mack	VMAC	EFP110-00	EFP105-00
Navistar		EFP111-00	EFP106-00

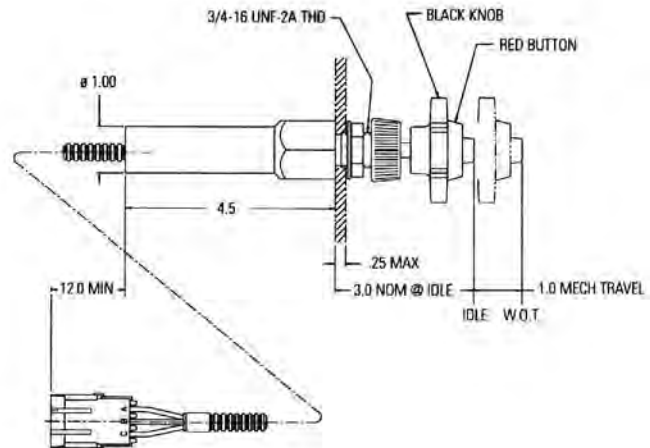
## EV2 (Vernier Control for Electronic Engines)

The Felsted® Electronic Vernier (EV2), has been designed to provide precise, variable engine speed adjustment on electronically controlled stationary engines, or from a remote operating position on mobile equipment. We have engineered the EV2 to allow capability with most electronically-controlled diesel engines.



The EV2 is easy to operate, even with gloves on. The **large (2-1/4") diameter**, easily identifiable knob provides continuous engine speed regulation **from idle to wide open throttle in seven (7) full turns**, providing fine engine speed adjustment. To prevent accidental overreving, the EV2 cannot be pulled to the wide open throttle position - it must be turned. It does, however, offer a **quick shut-down** feature activated by pushing in the knob. The EV2 also offers an adjustable friction collar to prevent accidental changes in engine speed. When a change in engine speed is desired, the friction collar may be loosened.

The Felsted EV2 is easily installed in a very limited amount of space. The EV2 requires a .78" diameter drilled hole, and only 4.5" clearance behind the dash panel. The EV2 is **pre-set at the factory**, with no field adjustment necessary. The potentiometer unit is sealed for protection against moisture and contaminants.



EV2 Product Numbers	Standard Models*	Part Number
Cummins	'B' and 'C' Series (no IVS)	EVR001
Detroit Diesel	DDEC I, II, III	55790-1
Mack	VMAC	EVR001
Navistar	T444E, DT446E, 530E	EVR001
*Consult factory for availability on other models.		

VMAC is a registered trademark of Mack Truck. • DDEC is a registered trademark of Detroit Diesel Corporation.

### Chassis Harness / Connector

Requires customer supplied items as follows: Packard Electric Connector - Three Way Weatherpack

EV2 Product Numbers	Packard P/N	Cable Diameter
1 pc. Tower	12015793	
3 pc. Female Terminal (typical)	12010182	#14 - 16 gauge
3 pc. Seal (typical)	12015899	.06" - .08"

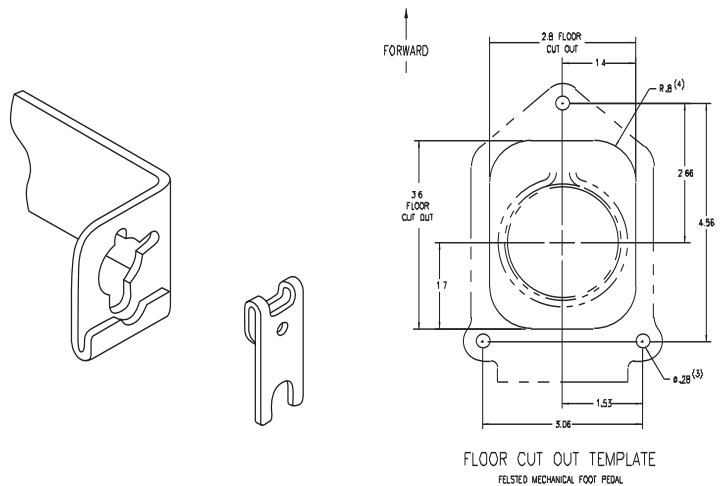
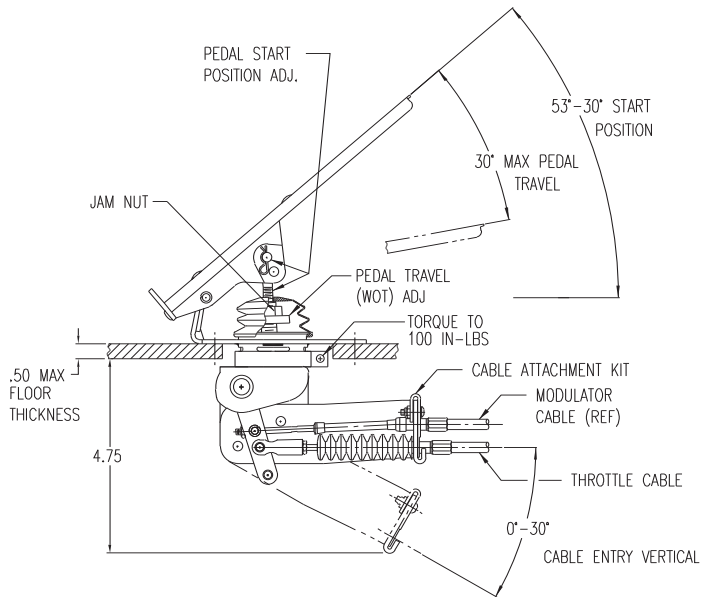
## Felsted Foot Pedal - Mechanical

The Felsted foot pedal is the heavy-duty choice for trucks, buses, agricultural equipment, construction equipment, and virtually all other applications that call for a foot operated control. That's because its rugged steel stamping construction offers far greater rigidity, durability, and reliability than aluminum die castings. And because it's designed with oil impregnated bronze bearings that won't wear out like nylon bearings. For ease of installation, it bolts to the floor with three point mounting and incorporates a unique keyhole mount for the cable hub that requires only a single fastener. For flexibility, it has 360° adjustability for cable entry, is available with either two-inch or three-inch travel, and either three or four series cable. And for even greater flexibility, you can connect a modulator to the pedal, eliminating the need for cumbersome linkages to the engine governor. Other features include a self-cleaning boot that deflects dirt and debris, a double torsion pedal return spring, adjustable pedal height, and a factory assembled heel rest. When used with Felsted cables and modulators, the Felsted Foot Pedal gives you a complete system you can rely on.



### Specifications for Foot Pedal

<b>Horizontal Cable Entry</b>	360° Adjustable
<b>Vertical Cable Entry</b>	0° - 30° Adjustable
<b>Pedal Angle</b>	30° - 53° At Idle
<b>Cable Travel</b>	2" - 3" Travel Available
<b>Cable Size</b>	3 or 4 Series Option
<b>Construction</b>	Steel Stamping - Plated for Corrosion Resistance
<b>Bearings</b>	Oil impregnated Bronze Bearings
<b>Upper Boot</b>	Neoprene
<b>Pedal Return Spring</b>	Double Torsion
<b>Pedal Stop</b>	Adjustable, Enclosed for Protection
<b>Floor Thickness</b>	Up to .50" Max.
<b>Protrusion Underfloor</b>	2" Travel: 4 3/4" 3" Travel: 4 3/4"
<b>Main Linkage Bearings</b>	Self Aligning
<b>Cable Hub Connection</b>	Keyhole Mounting Requires Single Fastener*
<b>Pedal Load</b>	Recommended Maximum Load: 25 lbs. Pedal Load at Installation Should Not Exceed 12 lbs. Recommended Maximum Load at Wide Open Throttle Stop: 100 lbs.**
<b>Mechanical Advantages</b>	2" Travel: 1.4 3" Travel: 1.0
<b>Modulator</b>	Available With or Without Modulator Pivot (Special Modulator Required - See Back Page)
<b>Heel Rest</b>	With or Without Heel Rest, Can Be Field Installed



Single Fastener Keyhole Mounting System For Easy Installation (Note: Felsted cables and pedal modulators must be used to engage keyhole mounting feature.)

### Floor Cut Out Template for Felsted Mechanical Foot Pedal

All measurements in inches.

Specifications subject to change without notice.

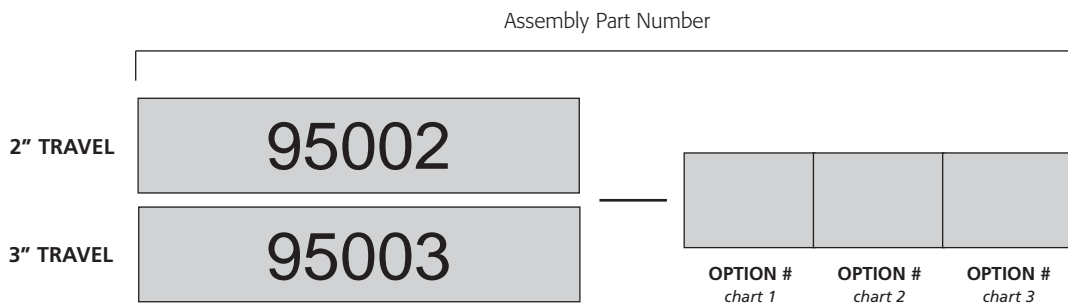
\*Felsted cables and modulators must be used to engage keyhole mounting system.

\*\*Based on load applied to pedal surface 6 inches from pedal pivot and 90° to surface.

## How to Order a Foot Pedal - Mechanical

Ordering the foot pedal that meets your needs is not difficult. Simply follow the instructions below to create the assembly part number. The first five numbers will be followed by three numbers that are chosen from the charts below.

1. Choose either a 2" or 3" Travel. This number is your BASIC NUMBER.
2. Choose the appropriate options from charts 1, 2, and 3.
3. Place each option number that you have chosen into its corresponding colored box. These create your ASSEMBLY CODE.
4. Combine all eight numbers to create the ASSEMBLY PART NUMBER.  
For example, the final assembly part number could possibly be 95002-300. (2" travel, 3 series, no heel rest, no modulator)



CABLE SERIES OPTIONS		CHART 1
3 Series	<b>3</b>	4 Series <b>4</b>

HEEL REST OPTIONS		CHART 2
No Heel Rest	<b>0</b>	With Heel Rest <b>1</b>

MODULATOR PIVOT		CHART 3
No Modulator	<b>0</b>	With Pivot Modulator <b>1</b>

## Foot Pedal Service Parts

### Cable Hanger Kit

99000-1 = 2" Travel  
99000-2 = 3" Travel

Includes:  
Hanger Assembly  
Flange Nuts (2)

### Cable Attach Kit

99001-1 = 3 Series  
99001-2 = 4 Series

Includes:  
Lock Plate Assembly and Screw  
Pin and Hair Pin Cotter  
Clevis

### Upper Boot Kit

99002-1

Includes:  
Upper Boot  
Pin and Hair Pin Cotter  
Jam Nut

### Heel Rest Kit

99003-1

Includes:  
Heel Rest  
Self Tap Screws (2)

## Modulators for Foot Pedal \*

### Modulators

98000-Length = 2" Travel  
98001-Length = 3" Travel

Allison Transmissions Only

## Cables \*

### 3 Series

# 10-32UNF-2A

352X3-Length = 2" Travel  
353X3-Length = 3" Travel

### 4 Series

1/4-28UNF-2A

452X3-Length = 2" Travel  
453X3-Length = 3" Travel

\* Felsted cables and modulators must be used to engage keyhole mounting system.

Other configurations available. Consult Factory.  
X = Specify 2 for bulkhead, 3 for clamp.