



E12327-00



BIG BERTHA™ XSM 30

30" Extreme Strip
and Scrub Machine



Operator and Parts
Manual

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WARNING - CARBON MONOXIDE LETHAL EXHAUST GAS - MUST READ THIS! -



Never Run The Engine In A Closed Building Or Confined Area

Exhaust gases contain poisonous carbon monoxide.
Carbon monoxide is odorless, colorless, and can cause death if inhaled.

Carbon Monoxide Poisoning Symptoms

Train your employees to know the warning signs of carbon monoxide poisoning.

Mild carbon monoxide poisoning may cause any of the following:
Headache, drowsiness, faintness, poor coordination, nausea, and vomiting.
Turn the engine off and immediately get to fresh air if you have any of these symptoms.

Do not run the machine until it is given an emissions test and repairs made by an authorized distributor.

- Local emissions testing is available at a fork-lift service department.

Moderate or severe carbon monoxide poisoning causes confusion, unconsciousness, chest pain, shortness of breath, and coma. Thus, most victims are not able to move themselves and must be rescued. Severe poisoning is often fatal.

Carbon monoxide is dangerous because a person may not recognize drowsiness as a symptom of poisoning. Consequently, someone with mild poisoning can go to sleep and continue to breathe the carbon monoxide until severe poisoning or death occurs. Some people with long-standing, mild carbon monoxide poisoning caused by furnaces or heaters may mistake their symptoms for other conditions, such as the flu or other viral infections.

Carbon Monoxide Detectors

CO detectors are a must for safe operation of your equipment. Various types are available. A "CO" carbon monoxide detector detects carbon monoxide before it reaches dangerous levels. Detectors are a must for those who run propane powered equipment. The CO Detector is for everyone's protection against Carbon Monoxide Poisoning.

- Carbon Monoxide Detector - Passive
 - Effective for 30 days after package has been opened.
 - Write the date opened on the detector.
 - Mount with self-adhesive strip on the machine handle.
 - Train machine operator to check detector regularly.
 - If the **orange disk changes to gray or black** - your Carbon Monoxide Levels are at a Dangerous Level.
 - If the **orange disk changes to gray or black** you must **turn your buffer off immediately** and return it to your nearest authorized distributor for an emissions test.
 - **Do Not Restart** the machine until the emissions have been checked and corrected.
 - This is for your protection as well as your customers. CO detectors are a must for safe operation and maximum efficiency of your equipment.
 - For replacement CO detectors, contact your distributor. Ask for the **carbon monoxide detector, part# E012426.**
- Carbon Monoxide Detector - battery operated with alarm
 - Available from various sources

SAFETY

Important Safety Information

All LPG (Liquid Propane Gas) powered engines, including this engine, produce Carbon Monoxide (CO). It is a **Lethal Poison** that is colorless, odorless, tasteless, and non-irritating gas. You must read “Danger: Lethal Exhaust Gas” information below.

Keep hands, feet, and loose clothing away from all moving parts while the machine is in operation. The exhaust system gets very hot so keep hands, clothing and any items that can burn away from the engine, engine manifold, and muffler.

These machines are tough and durable, however do not abuse the machine. With proper care and maintenance this unit will give you years of trouble free operation.

Carbon Monoxide Safety Information

Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide is odorless, colorless, tasteless, and can cause death if inhaled. Failure to provide proper venting of CO, failure to properly maintain the engine, or failure to properly train personnel of the dangers and warning signs of carbon monoxide exposure may result in **Serious Injury Or Death** to the operator and others in the area.

- Any equipment with the potential to produce carbon monoxide presents a significant hazard when used indoors. They must be used with great caution. Opening a door or window, or running an exhaust fan will not necessarily supply adequate ventilation. Avoid inhaling exhaust fumes and never run the engine in a closed building or confined area without proper ventilation.
- Do not allow engine to run unattended.
- If you have any indication that the engine is not running properly, immediately shut the machine off and have it checked over and repaired by qualified maintenance personnel.
- Workers should be trained to recognize the hazards of carbon monoxide and the early symptoms of carbon monoxide poisoning.
- A carbon monoxide detector and alarm should be available to alert workers of emissions.
- Have a carbon monoxide detector attached to machine handle or have machine operator wear a carbon monoxide detector. (See carbon monoxide detector page).
- Use only as described in this manual.
- Use only manufacturer’s recommended components.
- Maintenance and repairs must be done by qualified personnel.
- Only trained operators should be allowed to operate propane powered floor machines.
- If the machine is not working properly, have it serviced by an authorized service center.
- Install fuel cylinder in a well ventilated place.
- Be aware of possible leaks of propane gas if odor is present.
- If the machine is stored inside a building, remove the fuel cylinder and store properly outside.
- Secure fuel cylinders when being transported.
- If tank is left attached to the machine then valve should be OFF.
- Never store fuel cylinders in a vehicle, building, or area where they may be exposed to high temperature.
- Do not operate the machine with any openings blocked.
- Keep openings free of debris that may reduce airflow.
- Remove fuel cylinder and disconnect battery before servicing.

TANK USE AND STORAGE

Propane Tank Use

We use the Worthington gas cylinders designed for vapor withdrawal. The fuel lock offs, regulators, and engines are also designed for vapor withdrawal.

- We recommend that you use the OPD (Overflow Protection Device) vapor withdrawal type cylinder. These style tanks have a triangle shaped valve handle.
- Do not overfill - the best gauge is a scale - never allow tank to weigh over **36 pounds** for an aluminum tank and **43 pounds** for a steel tank.
- Connect fuel cylinder to machine in a well ventilated place.
- Be aware of possible leaks of propane gas if odor is present.
- Use propane tanks designed for vertical use only.
- New tanks must be purged of air at first filling.

Propane Tank Storage

- Store tanks outside in a well-ventilated area.
- Never store fuel cylinders in a vehicle, building, or area where they may be exposed to high temperature.
- If the machine is stored inside a building, remove the fuel cylinder and store properly outside.
- Secure fuel cylinders when being transported.
- If tank is left attached to the machine then valve should be OFF.
- Store tanks in the upright position (valves up).
- Be aware of possible leaks of propane gas if odor is present.

STARTING AND STOPPING THE KAWASAKI ENGINE

Starting The Kawasaki Engine

The Kawasaki engine is equipped with a 12 volt starter and a key switch start.

1. Place propane tank into handle assembly and close propane tank strap clamp to secure tank.
2. Attach propane hose coupling and fully tighten.
3. Start the Extreme Strip machine with the brushes in the running position, flat on the floor.
4. Open propane tank valve (turn counterclockwise) and check for any leaks.
5. Turn the ignition - Start switch to the 'start' position and hold it there until the engine starts. Do not crank for more than 20 seconds at a time and wait at least one minute between tries when cranking. See the troubleshooting guide if the engine does not start after several tries.
6. After engine starts, set the throttle so that the centrifugal clutch will not engage until the engine has warmed up. Do not operate the machine until the engine has warmed up sufficiently (3 to 5 minutes).
7. Check for frost on the regulator and fuel line. Frost will indicate that the machine is drawing liquid propane from an overfilled or incorrect tank.

Stopping The Kawasaki Engine

1. Turn propane tank valve to the closed position (turn clockwise) and allow the engine to continue running until it runs out of fuel. This can be done with the centrifugal engaged or not engaged.
2. Turn key to the off position.

**In an emergency, immediately turn the key to the 'off' position.
Backfiring may occur when using this method.**

OPERATOR PREPARATION

Before Starting the Machine

Read the Owner's Manual and the Engine Operation Manual.

Your machine is shipped ready for operation; however there is no fuel in the tank. When having the tank filled, you must make sure the tank is never over-filled.

- The best way to do this is to tell the filling station to weigh the tank full. On an aluminum tank, it should weigh no more than **36 pounds** and on a steel tank no more than **43 pounds**. (See more information at "Tank Storage and Maintenance" page.)

Adjust the handle for comfortable operation. Remove detent pins from handle and adjust to the hole alignment that gives the most comfortable height. Replace detent pins. Tighten nuts and bolts if needed.

Check Oil Level: Starting the engine without the proper amount of oil will cause severe engine damage. Always keep the engine oil level between the full and add marks on the dipstick. Do not loosen oil fill cap or remove dipstick while engine is running.

- Park your machine on a level surface.
- Turn the oil fill cap counter clockwise and then lift from the fill tube.
- Wipe the dip stick clean and push it back into the oil fill tube until the cap seats and then withdraw it to check: the oil level. (Do not screw cap on to check oil). Add if necessary. If the oil level is low, add API Class SM oil having a SAE viscosity grade appropriate for the expected temperatures as indicated in the Operators Manual (Usually a HD30 or 10W30).
- Important Note: **Do Not Overfill**
- Replace oil cap.

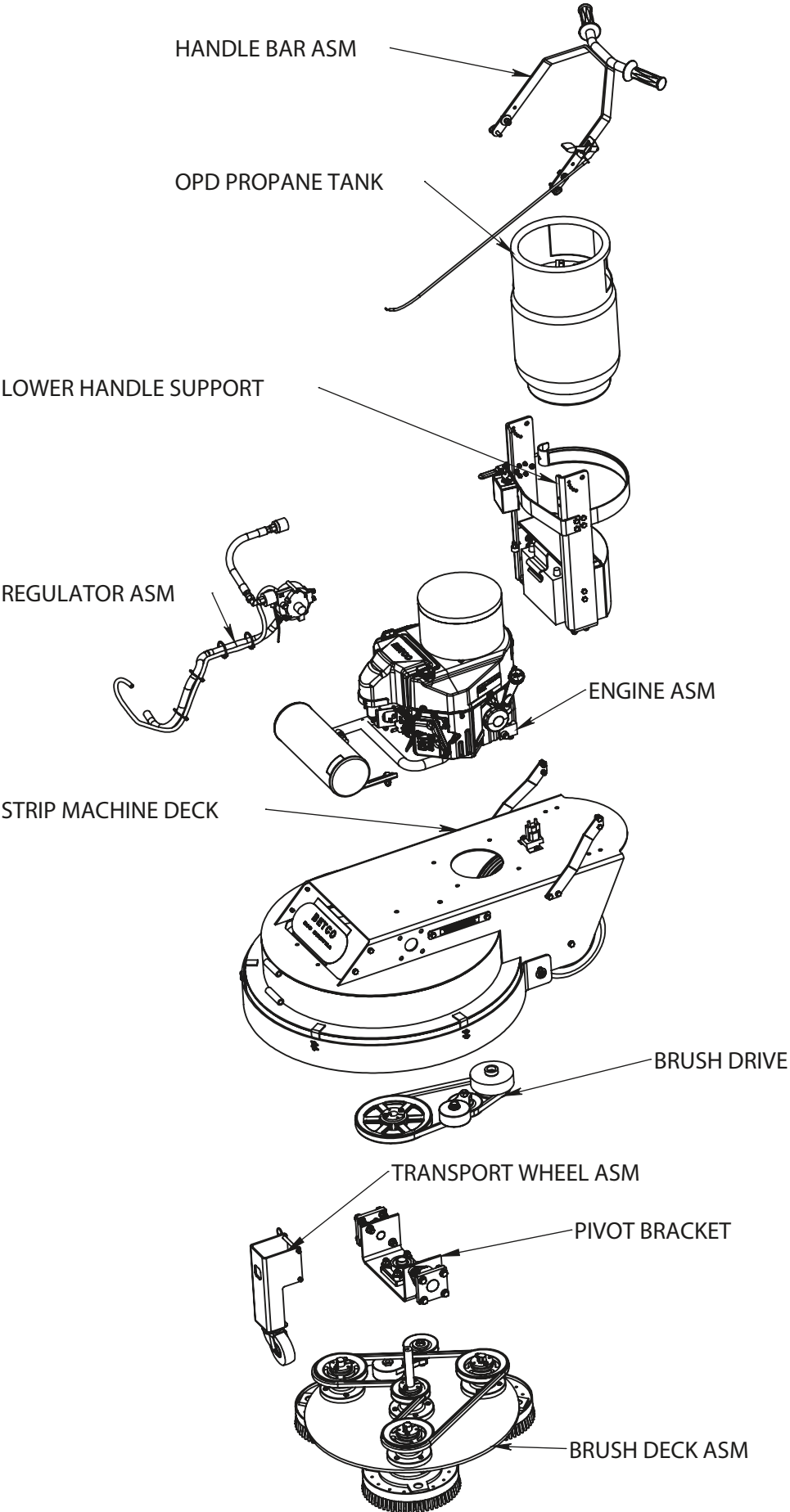
Inspect fuel hoses and fittings for wear and leaks. Have all worn hoses and leaks repaired before operating.

Look and listen for exhaust leaks. Have all leaks repaired before operating.

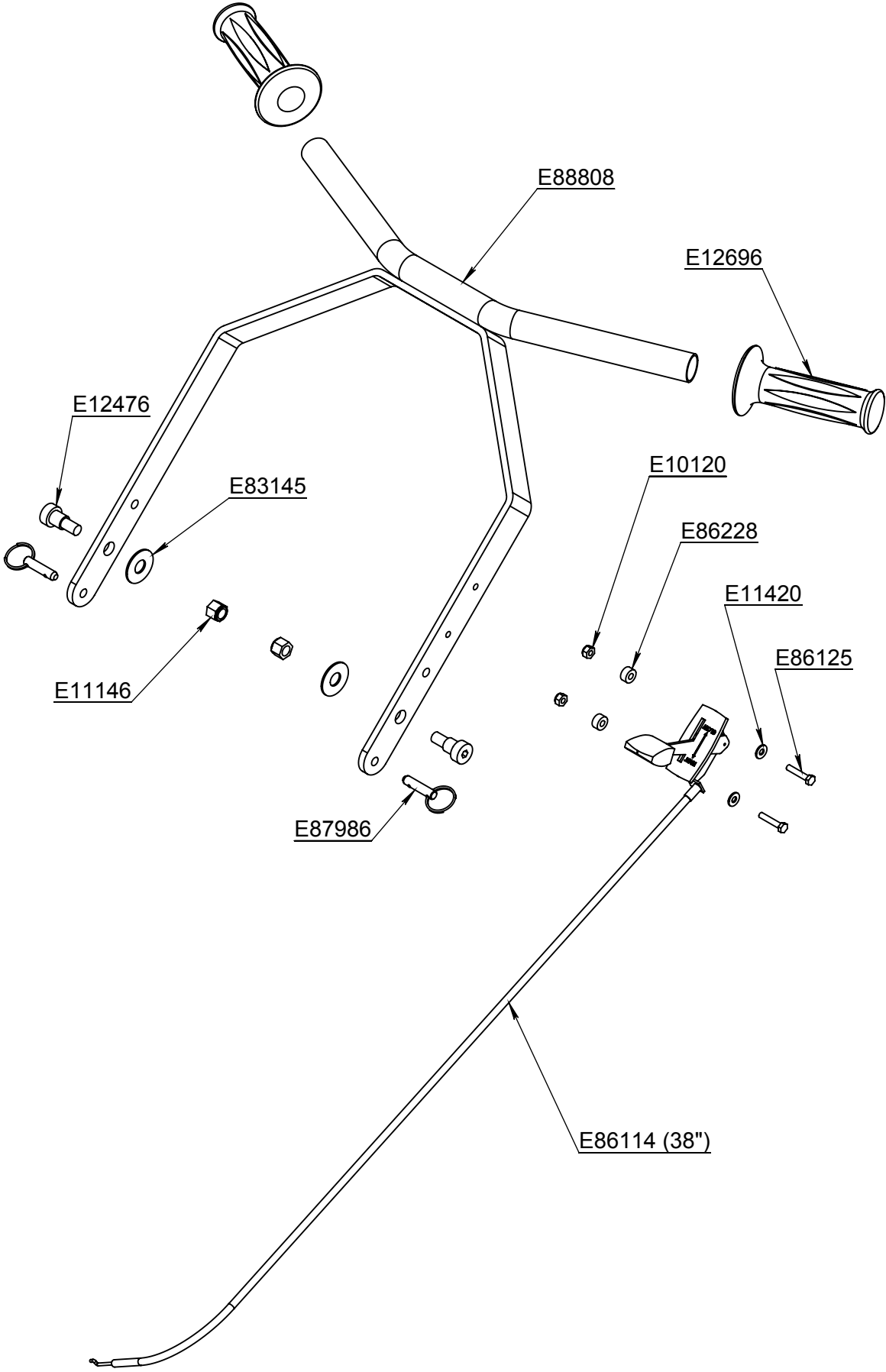
Check the carburetor filter and air filter for debris. Clean and replace if necessary.

Connect fuel hose to tank by screwing the hose fitting to tank. You must tighten all the way down to make fuel connection. Turn tank knob slowly until you hear the flow of fuel into fuel system.

MAJOR ASSEMBLIES

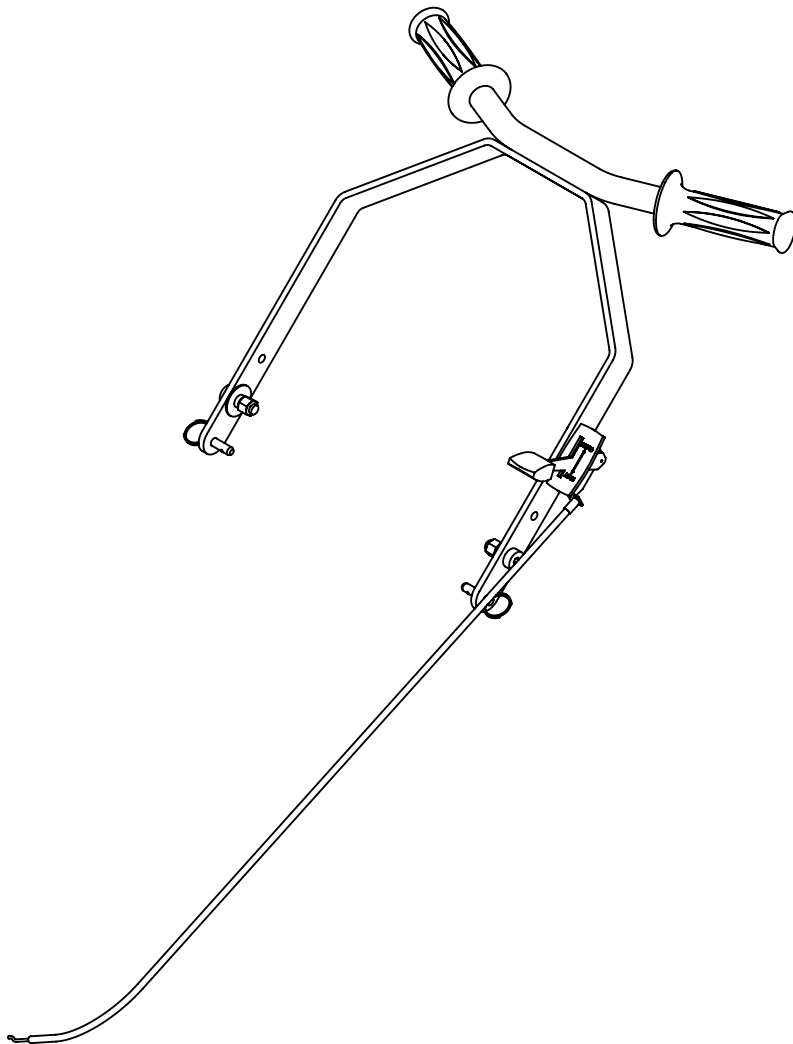


HANDLE BAR



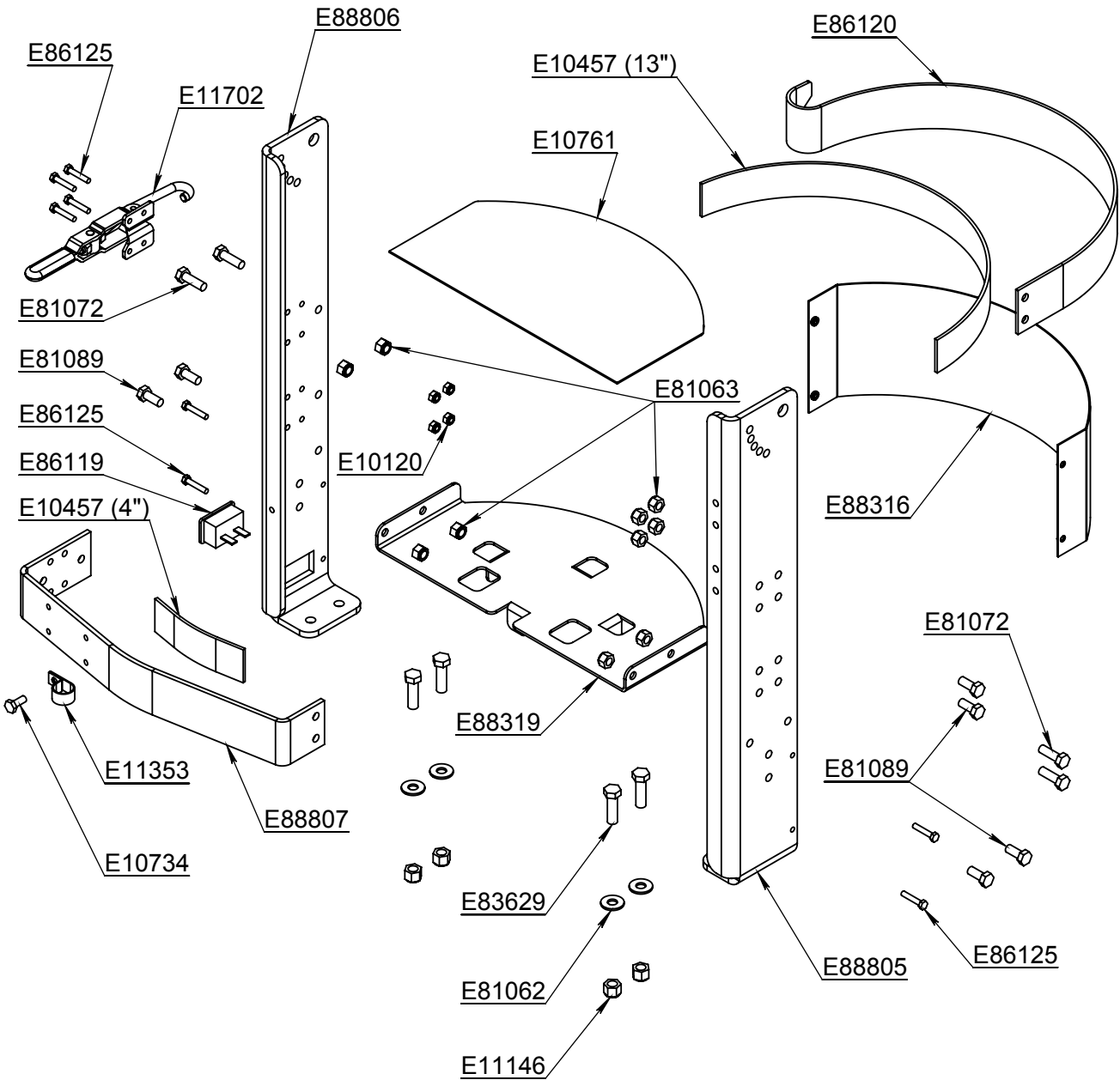
| PART NUMBER | Description | QTY. |
|-------------|---|------|
| E10120 | Nut, #10-32, Nylon Lock, Grade 5, Zinc | 2 |
| E11146 | Nut, 3/8"-16, Nylon Lock, Grade 5, Zinc | 2 |
| E11420 | Washer, #10 SAE, Zinc | 2 |
| E12476 | Screw, Shoulder 1/2" x 1/2" Socket Head | 2 |
| E12696 | Hand Grip | 2 |
| E83145 | Washer, Nylon 1/2" ID X 1.25" OD | 2 |
| E86114 | Kawasaki Throttle Cable 38" L | 1 |
| E86125 | Screw, #10-32 x 1.000 Hex Head, Zinc | 2 |
| E86228 | Spacer, #10 ID x 1/2" OD x 1/4" Long, Black Nylon | 2 |
| E87986 | Pin, 5/16" x 3/4" Detent with Ring | 2 |
| E88808 | Handle Bar Weldment | 1 |

Note: Not available for purchase assembled.



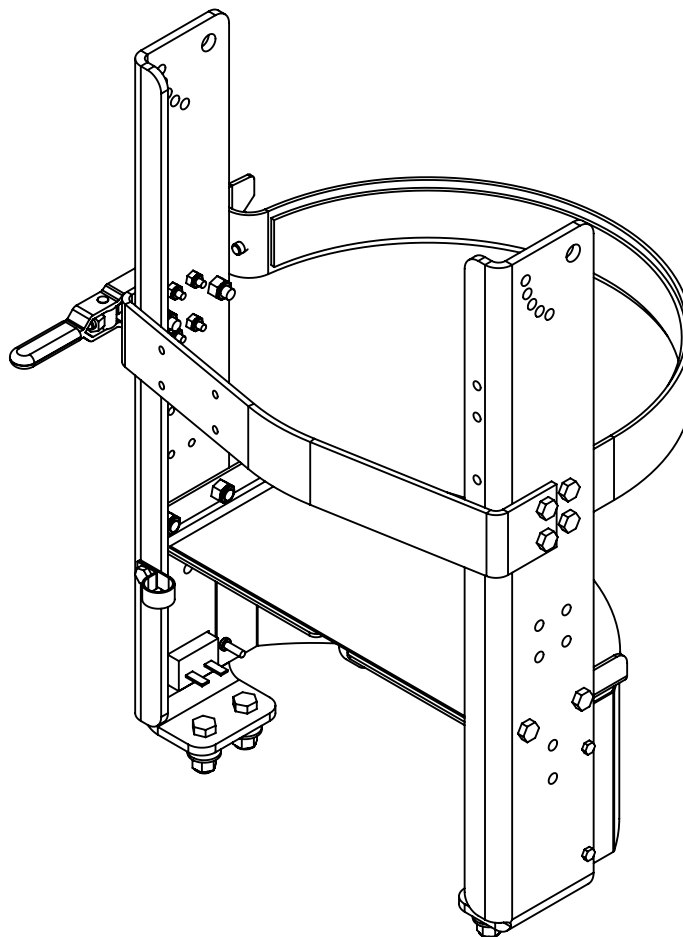
LOWER HANDLE SUPPORT

(For Serial Numbers Before 6999)



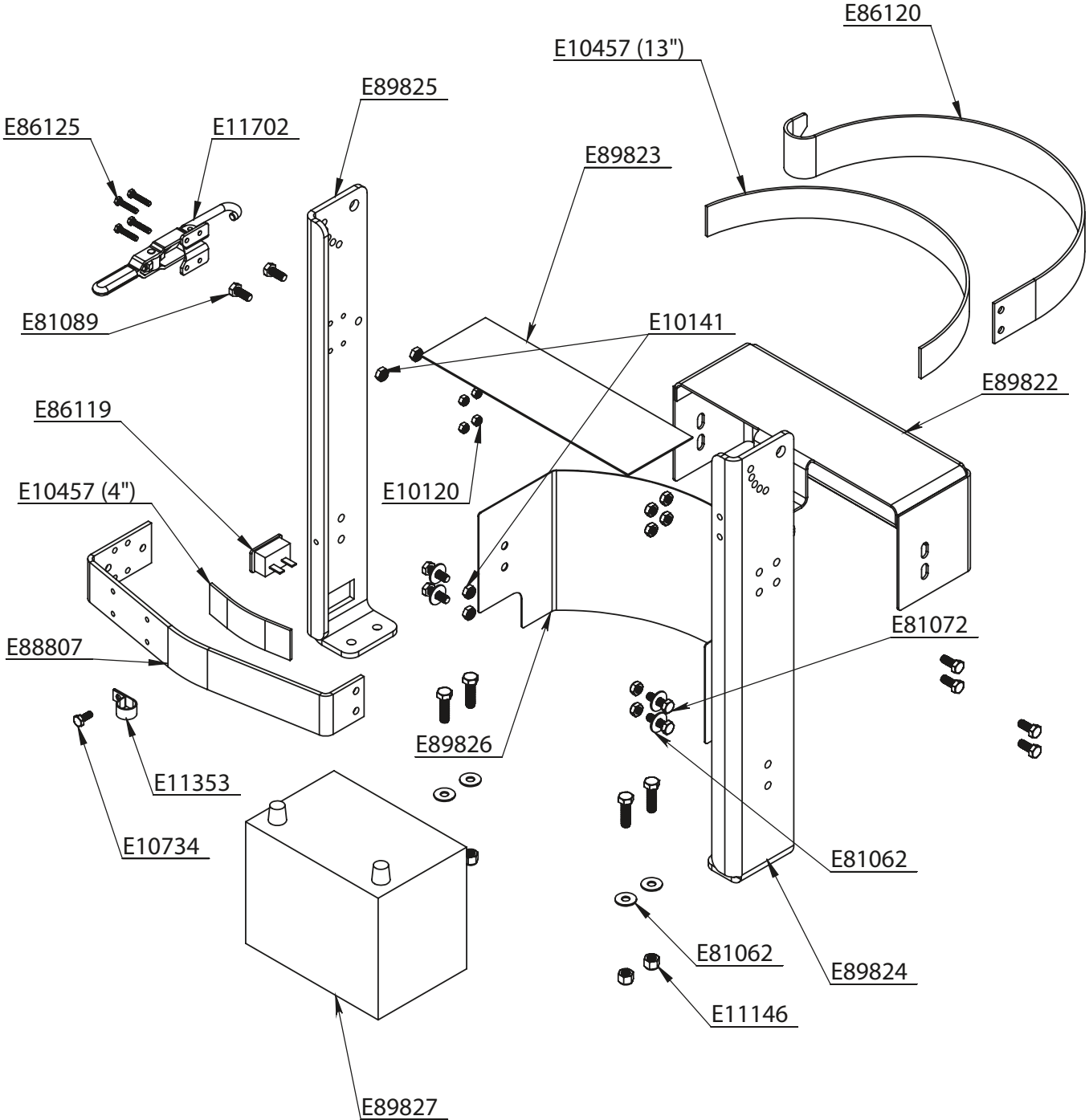
| PART NUMBER | Description | QTY. |
|-------------|---|------|
| E10120 | Nut, #10-32, Nylon Lock, Grade 5, Zinc | 4 |
| E10457 | Felt, 1.500 W x 0.125 Thick, Adhesive Back | 2 |
| E10734 | Screw, 1/4"-20 x 0.625 Hex Head, Grade 5, Zinc | 1 |
| E10761 | Rubber Propane Tank Shelf Pad | 1 |
| E11146 | Nut, 3/8"-16, Nylon Lock, Grade 5, Zinc | 4 |
| E11353 | Tube Clamp 3/4" (COV-1309) | 1 |
| E11702 | Propane Tank Strap Latch | 1 |
| E81062 | Washer, 5/16" USS, Zinc | 4 |
| E81063 | Nut, 5/16"-18, Nylon Lock, Grade 5, Zinc | 10 |
| E81072 | Screw, 5/16"-18 x 1.000 Hex Head, Grade 5, Zinc | 4 |
| E81089 | Screw, 5/16"-18 x 0.750 Hex Head, Grade 5, Zinc | 6 |
| E83629 | Screw, 3/8"-16 x 1.250 Hex Head, Grade 5, Zinc | 4 |
| E86119 | Hour Meter, SenDEC 5-80V | 1 |
| E86120 | Propane Tank Strap Back | 1 |
| E86125 | Screw, #10-32 x 1.000 Hex Head, Zinc | 8 |
| E88316 | Battery Cover | 1 |
| E88319 | Propane Tank Shelf | 1 |
| E88805 | Lower Handle Leg Left | 1 |
| E88806 | Lower Handle Leg Right | 1 |
| E88807 | Propane Tank Strap Front | 1 |

Note: Not available for purchase assembled.



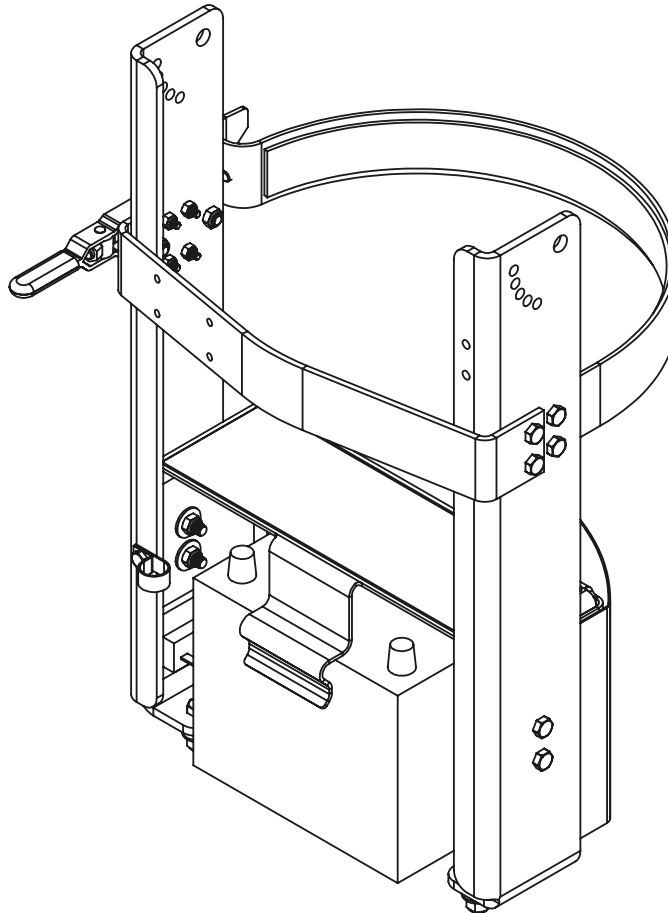
LOWER HANDLE SUPPORT

(For Serial Numbers 7000 and Greater)

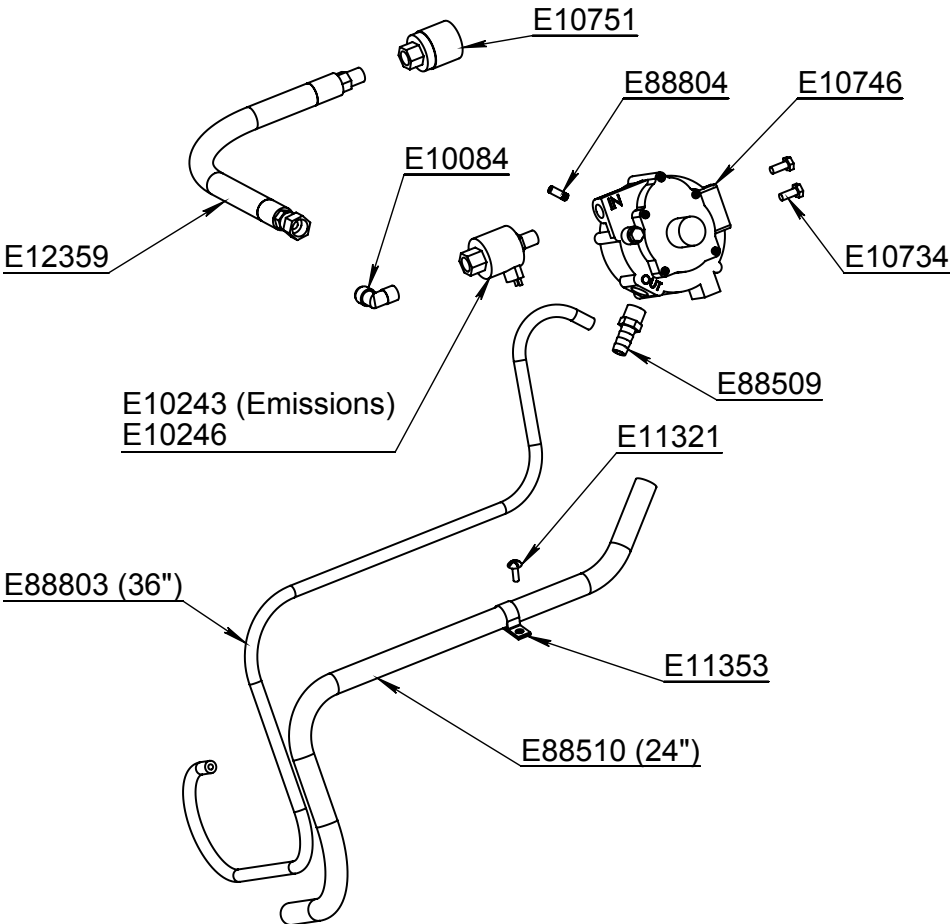


| PART NUMBER | DESCRIPTION | QUANTITY |
|-------------|--|----------|
| E10120 | NYLOC HEX NUT 10-32 | 4 |
| E10141 | NYLOC HEX JAM NUT 0.3125-18 ZINC | 10 |
| E10457 | FELT, 1.500 W x 0.125 THK, ADHESIVE BACKED | 2 |
| E10734 | HEX HEAD BOLT 1/4-20 x 5/8 LG | 1 |
| E11146 | NYLOC HEX NUT 3/8-16, ZINC | 4 |
| E11353 | TUBE CLAMP 3/4" | 1 |
| E11702 | PROPANE TANK STRAP CLAMP | 1 |
| E81062 | FLAT WASHER 5/16 USS, ZINC | 8 |
| E81072 | HEX HEAD SCREW 5/16-18 x 1.00 LG | 4 |
| E81089 | HEX HEAD BOLT 5/16-18 x 3/4 LG | 6 |
| E83629 | HEX HEAD BOLT 3/8-16 x 1-1/4 LG | 4 |
| E86119 | HOUR METER | 1 |
| E86120 | PROPANE TANK STRAP BACK | 1 |
| E86125 | HEX HEAD BOLT, 10-32 x 1.00 LG | 4 |
| E88807 | PROPANE TANK STRAP FRONT | 1 |
| E89822 | BATTERY CLAMP AND PROPANE SUPPORT | 1 |
| E89823 | RUBBER PROPANE TANK SHELF PAD | 1 |
| E89824 | LOWER HANDLE LEG LEFT | 1 |
| E89825 | LOWER HANDLE LEG RIGHT | 1 |
| E89826 | BATTERY COVER | 1 |
| E89827 | BATTERY U1 12 VOLT | 1 |

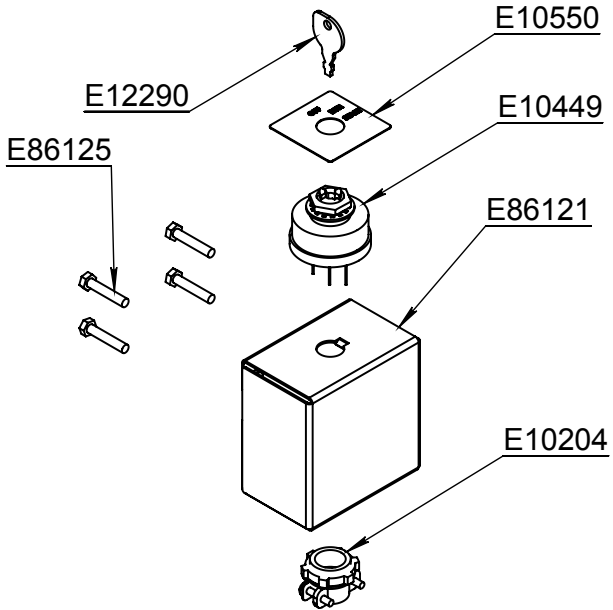
Note: Not available for purchase assembled.



REGULATOR ASSEMBLY

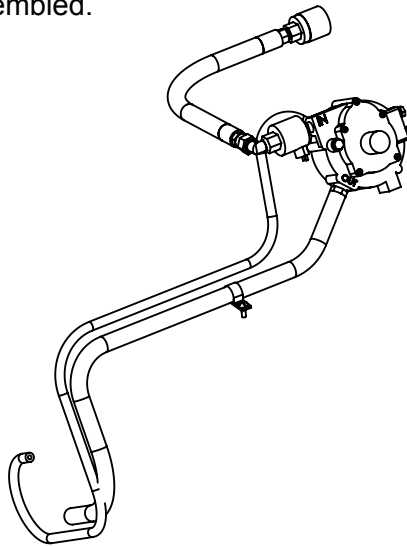


12V STARTER SWITCH



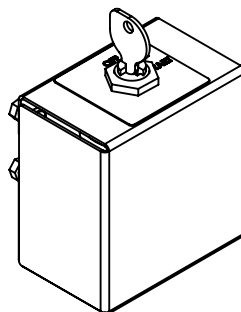
| PART NUMBER | Description | QTY. |
|--------------------|---|-------------|
| E10084 | Fitting, 3/8 MJIC x 3/8 MNPT, 90 Elbow, Brass | 1 |
| E10243 | In Line Fuel Shut Off Valve Model 152 (With Emissions) | 1 |
| E10246 | In Line Fuel Shut Off Valve Model 151 | 1 |
| E10734 | Screw, 1/4"-20 x 0.625 Hex Head, Grade 5, Zinc | 2 |
| E10746 | Fuel Regulator Model 60E | 1 |
| E10751 | Propane Tank Coupling 7141F | 1 |
| E11321 | Screw #10 x 5/8" Sheet Metal, Pan Head, Phillips, Black | 1 |
| E11353 | Tube Clamp 3/4" (COV-1309) | 1 |
| E12359 | Propane Tank Hose 1/4" MNPT - 3/8" MJIC 16.50" L | 1 |
| E88509 | Fitting, Hose Barb 3/8" MNPT x 1/2" Barb, Brass | 1 |
| E88510 | 1/2" ID Braided Gasoline Fuel Hose (24") | 1 |
| E88803 | Hose, 3/16" ID Vacuum | 1 |
| E88804 | Fitting, 1/4"-28 Thread, 1/4" OD, 0.046 Wall,0.700 L, Brass | 1 |

Note: Not available for purchase assembled.



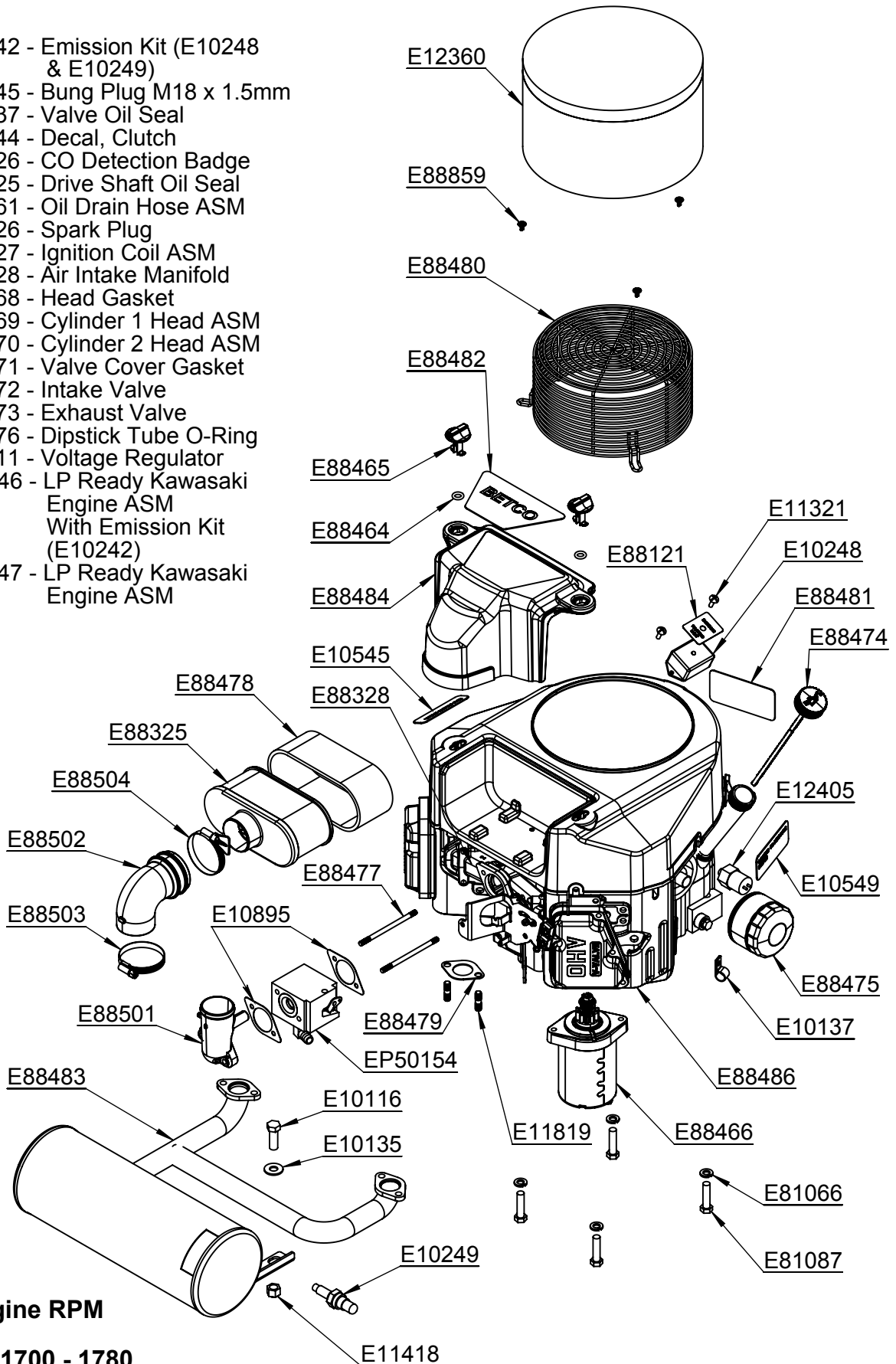
| PART NUMBER | Description | QTY. |
|--------------------|--------------------------------------|-------------|
| E10204 | Wire Clamp, 3/8" Romex Connector | 1 |
| E10449 | 5 Wire Keyed Ignition Switch | 1 |
| E10550 | Decal, OFF/ON/START | 1 |
| E12290 | Ignition Switch Key | 1 |
| E86121 | Key Switch Box | 1 |
| E86125 | Screw, #10-32 x 1.000 Hex Head, Zinc | 4 |

Note: Not available for purchase assembled.



KAWASAKI ENGINE ASSEMBLY

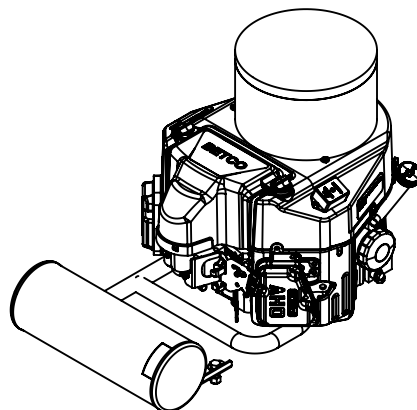
- E10242 - Emission Kit (E10248 & E10249)
- E10245 - Bung Plug M18 x 1.5mm
- E10337 - Valve Oil Seal
- E10544 - Decal, Clutch
- E12426 - CO Detection Badge
- E12525 - Drive Shaft Oil Seal
- E85461 - Oil Drain Hose ASM
- E88326 - Spark Plug
- E88327 - Ignition Coil ASM
- E88328 - Air Intake Manifold
- E88468 - Head Gasket
- E88469 - Cylinder 1 Head ASM
- E88470 - Cylinder 2 Head ASM
- E88471 - Valve Cover Gasket
- E88472 - Intake Valve
- E88473 - Exhaust Valve
- E88476 - Dipstick Tube O-Ring
- E88511 - Voltage Regulator
- EP50146 - LP Ready Kawasaki Engine ASM With Emission Kit (E10242)
- EP50147 - LP Ready Kawasaki Engine ASM



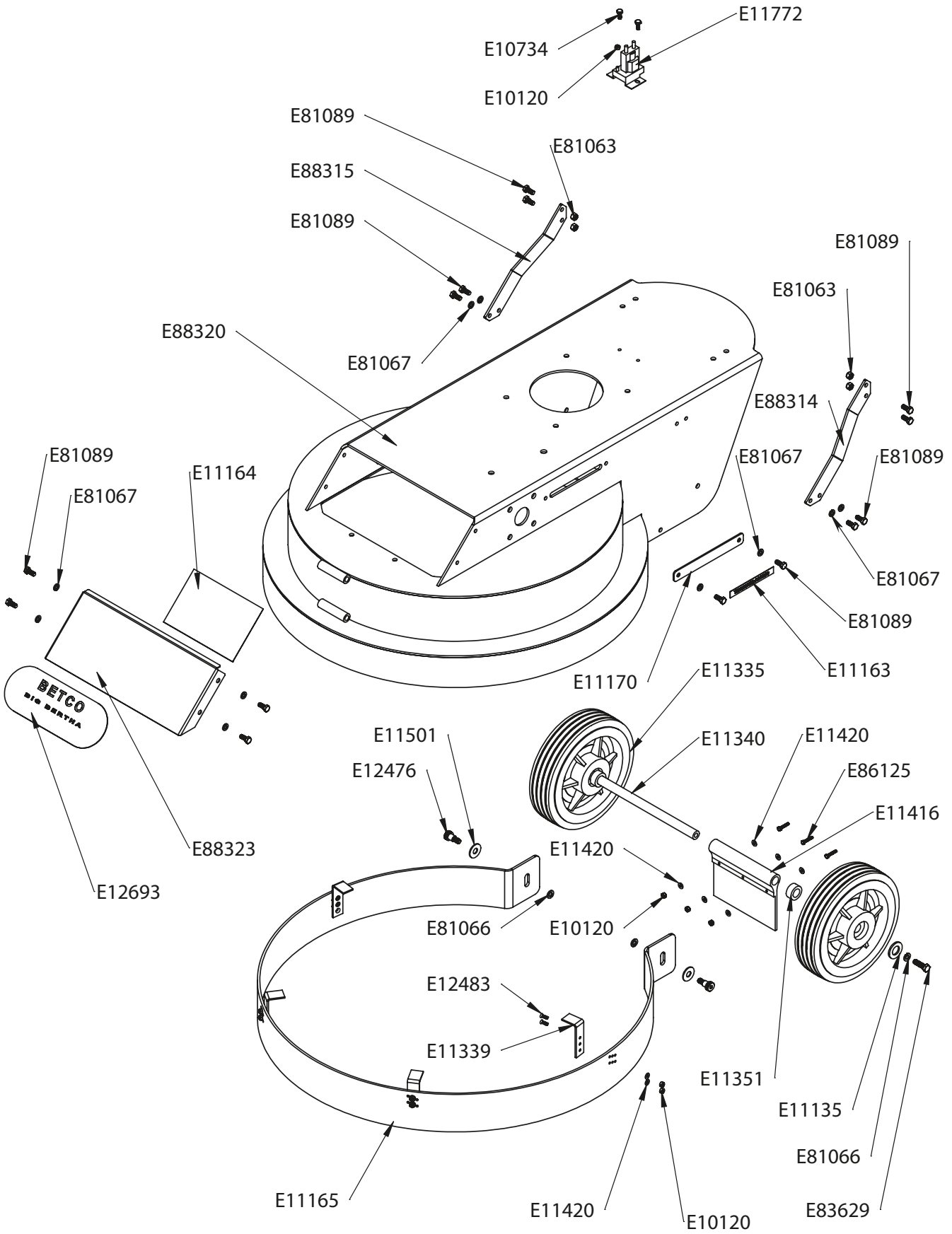
Engine RPM

Idle = 1700 - 1780
Full Throttle = 3600

| PART NUMBER | Description | QTY. |
|-------------|--|------|
| E10116 | Screw, 7/16"-14 x 1.250 Hex Head, Grade 5, Zinc | 1 |
| E10135 | Washer, 3/8" USS, Zinc | 1 |
| E10137 | Clamp, Tube 1/2" (COV-0909) | 1 |
| E10242 | Emissions Kit (E10248, E10249) | 1 |
| E10245 | Bung Plug M18 x 1.5mm | 1 |
| E10248 | O2 Sensor Electrical Control Box | 1 |
| E10249 | O2 Sensor | 1 |
| E10337 | Valve Oil Seal | 4 |
| E10544 | Decal, Clutch | 1 |
| E10545 | Decal, Read Oners Manual | 1 |
| E10549 | Decal, Caution Oil Pressure Switch | 1 |
| E10895 | Gasket, Carburetor to Air-Fuel Hub | 2 |
| E11321 | Screw #10 x 5/8" Sheet Metal, Pan Head, Phillips, Black | 2 |
| E11418 | Nut, 7/16"-14, Nylon Lock, Grade 5, Zinc | 1 |
| E11819 | Stud, 8mm x 18mm L | 4 |
| E12360 | Cooling Air Intake Filter | 1 |
| E12405 | Oil Pressure Switch | 1 |
| E12426 | CO Detector Badge | 1 |
| E12525 | Drive Shaft Oil Seal | 1 |
| E81066 | Washer, 3/8" Split Lock, Zinc | 4 |
| E81087 | Screw, 3/8"-16 x 1.500 Hex Head, Grade 5, Zinc | 4 |
| E85461 | Oil Drain Hose Accessory | 1 |
| E88121 | Decal, Emissions Warning Light | 1 |
| E88325 | Air Intake Filter Paper | 1 |
| E88326 | Spark Plug | 2 |
| E88327 | Ignition Coil ASM | 2 |
| E88328 | Air/Fuel Intake Manifold | 1 |
| E88464 | O-Ring 12.5mm ID x 3.4mm T | 2 |
| E88465 | Air Filter Thumb Nut | 2 |
| E88466 | 12V Starter | 1 |
| E88468 | Head Gasket | 2 |
| E88469 | Cylinder 1 Head ASM | 1 |
| E88470 | Cylinder 2 Head ASM | 1 |
| E88471 | Valve Cover Gasket | 2 |
| E88472 | Intake Valve | 2 |
| E88473 | Exhaust Valve | 2 |
| E88474 | Oil Dipstick | 1 |
| E88475 | Oil Filter | 1 |
| E88476 | O-Ring | 1 |
| E88477 | Stud, 6mm x 95mm L | 2 |
| E88478 | Air Intake Filter Foam | 1 |
| E88479 | Muffler Gasket | 2 |
| E88480 | Cooling Air Intake Guard | 1 |
| E88481 | Decal, Emissions | 1 |
| E88482 | Decal, Air Filter Cover | 1 |
| E88483 | Muffler, Catalytic, & Manifold Kawasaki FS481V | 1 |
| E88484 | Air Filter Cover | 1 |
| E88486 | Kawasaki Engine Gasoline Ready 16HP | 1 |
| E88501 | Carburetor Intake Neck | 1 |
| E88502 | Air Intake Elbow | 1 |
| E88503 | Air Intake Elbow to Neck Clamp | 1 |
| E88504 | Air Intake Elbow to Filter Clamp | 1 |
| E88511 | Voltage Regulator | 1 |
| E88859 | Rivet, Push, Cooling Air Intake Guard, FS481V ASM | 3 |
| EP50146 | LP Ready Kawasaki Engine Assembly With Emission Kit (E10242) | 1 |
| EP50147 | LP Ready Kawasaki Engine Assembly | 1 |
| EP50154 | Carburetor, LP Gas FS481V | 1 |

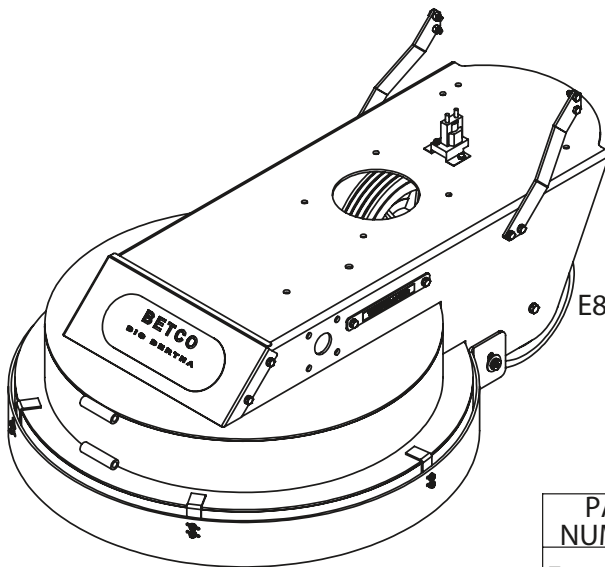


DECK ASSEMBLY

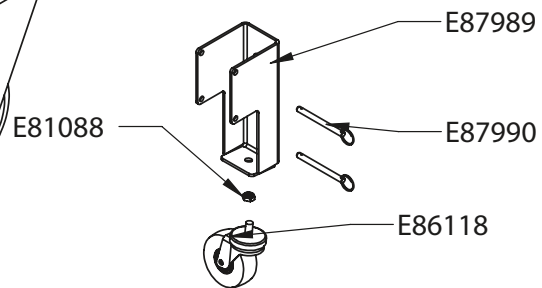


DECK PARTS

| PART NUMBER | DESCRIPTION | QTY. |
|-------------|--|------|
| E10120 | NYLOC HEX NUT 10-32 | 12 |
| E10734 | HEX HEAD BOLT 1/4-20 x 5/8 LG | 2 |
| E11135 | WASHER, 3/4" SAE, ZINC | 2 |
| E11163 | DECAL TENSIONER ACCESS | 1 |
| E11164 | DECAL, BELT PATH | 1 |
| E11165 | SPLASH SKIRT, 30 INCH | 1 |
| E11170 | TENSIONER ACCESS COVER | 1 |
| E11335 | WHEEL 10 INCH DIA x 2.50 WIDE | 2 |
| E11339 | SPLASH SKIRT HANGER | 4 |
| E11340 | WHEEL AXLE 3/4 OD | 1 |
| E11351 | SHAFT COLLAR 3/4 ID | 2 |
| E11416 | RUBBER SPLASH GUARD | 1 |
| E11420 | FLAT WASHER #10 ZINC | 14 |
| E11501 | WASHER, 7/16 USS, ZINC | 2 |
| E11772 | SOLENIOD 12 VDC | 1 |
| E12476 | SHOULDER SCREW 3/8-16 x 1/2 DIA x 1/2 LG | 2 |
| E12483 | FLAT HEAD SCREW 10-32 x 5/8 LG | 8 |
| E12693 | DECAL, BIG BERTHA | 1 |
| E81063 | NYLOC HEX NUT 5/16-18 ZINC | 4 |
| E81066 | SPLIT LOCK WASHER .375 | 4 |
| E81067 | LOCK WASHER 5/16 | 10 |
| E81089 | HEX HEAD BOLT 5/16-18 x 3/4 LG | 14 |
| E83629 | HEX HEAD BOLT 3/8-16 x 1-1/4 LG | 2 |
| E86125 | HEX HEAD BOLT, 10-32 x 1.00 LG | 3 |
| E88314 | HANDLE SUPPORT LEFT | 1 |
| E88315 | HANDLE SUPPORT RIGHT | 1 |
| E88320 | EXTREME STRIP FRAME 30 ASSEMBLY | 1 |
| E88323 | FRONT ACCESS PANEL | 1 |

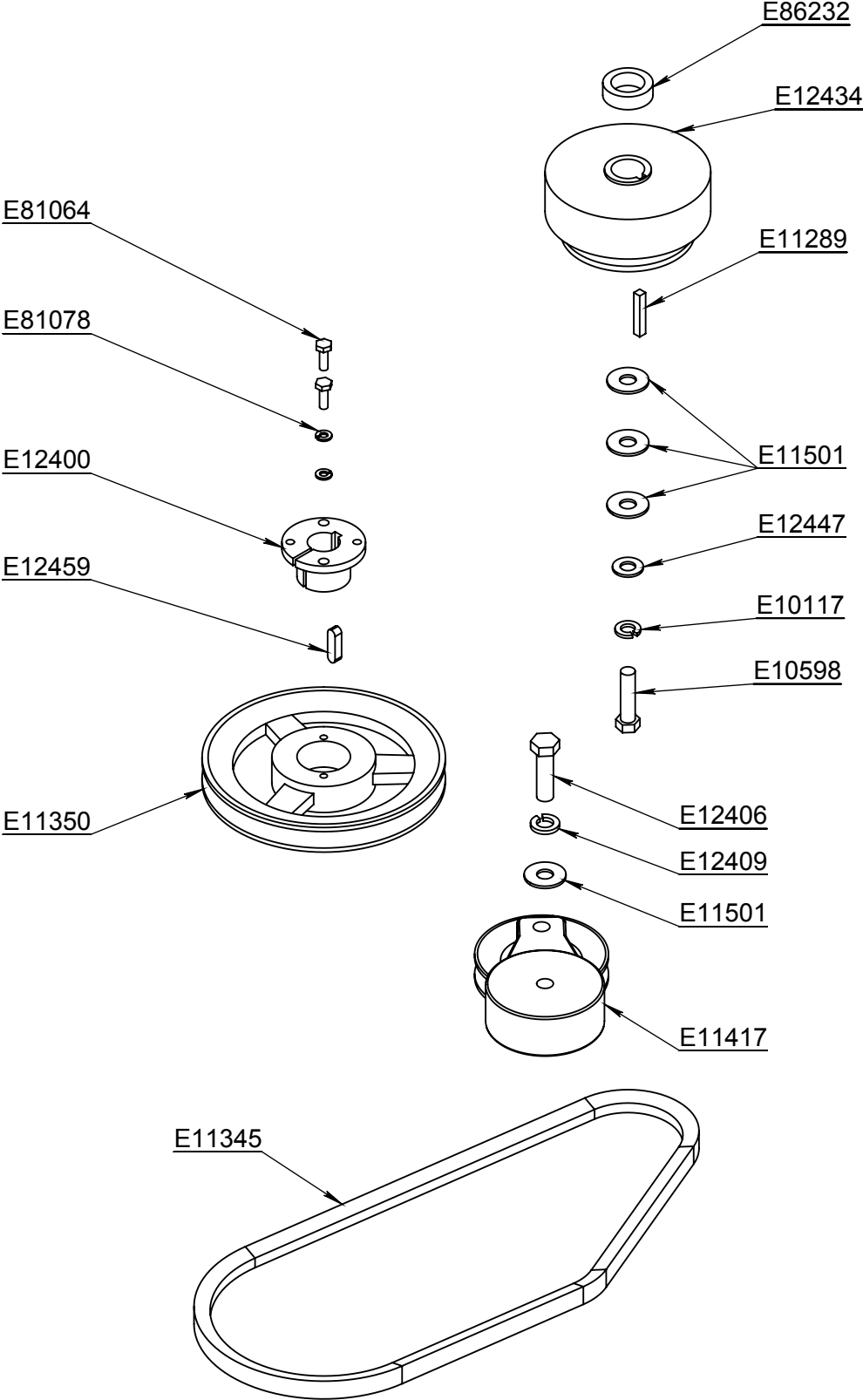


TRANSPORT WHEEL ASSEMBLY



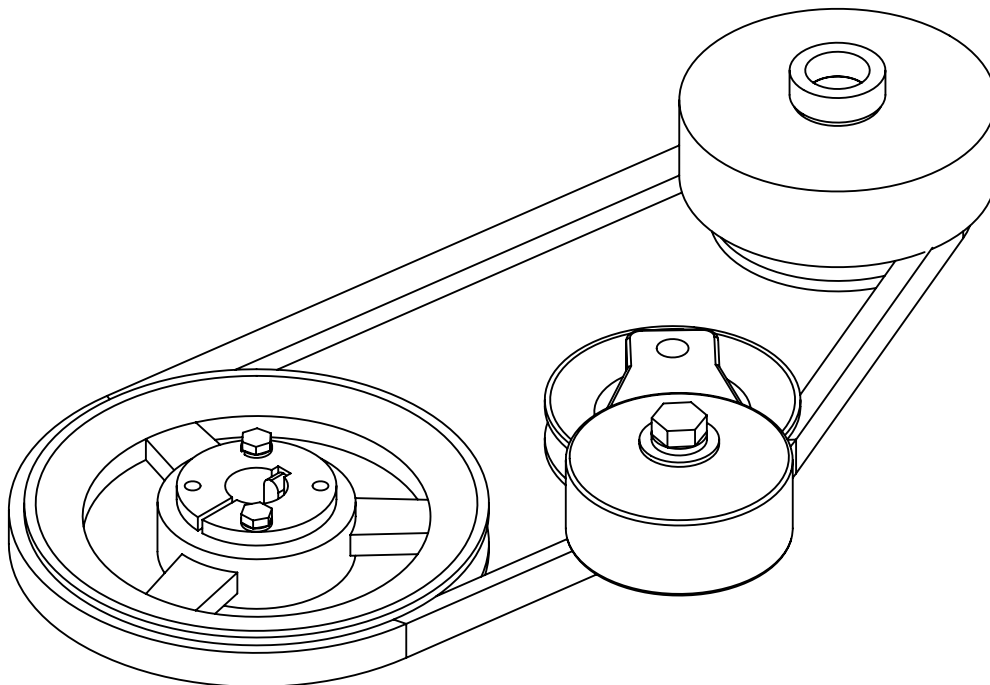
| PART NUMBER | DESCRIPTION | QTY. |
|-------------|----------------------------|------|
| E81088 | NYLOC JAM NUT 1/2-13 | 1 |
| E86118 | 3 INCH SWIVEL CASTER | 1 |
| E87989 | TRANSPORT WHEEL BRACKET | 1 |
| E87990 | DETENT PIN 3/8 x 4.0, RING | 2 |

MAIN DRIVE SYSTEM



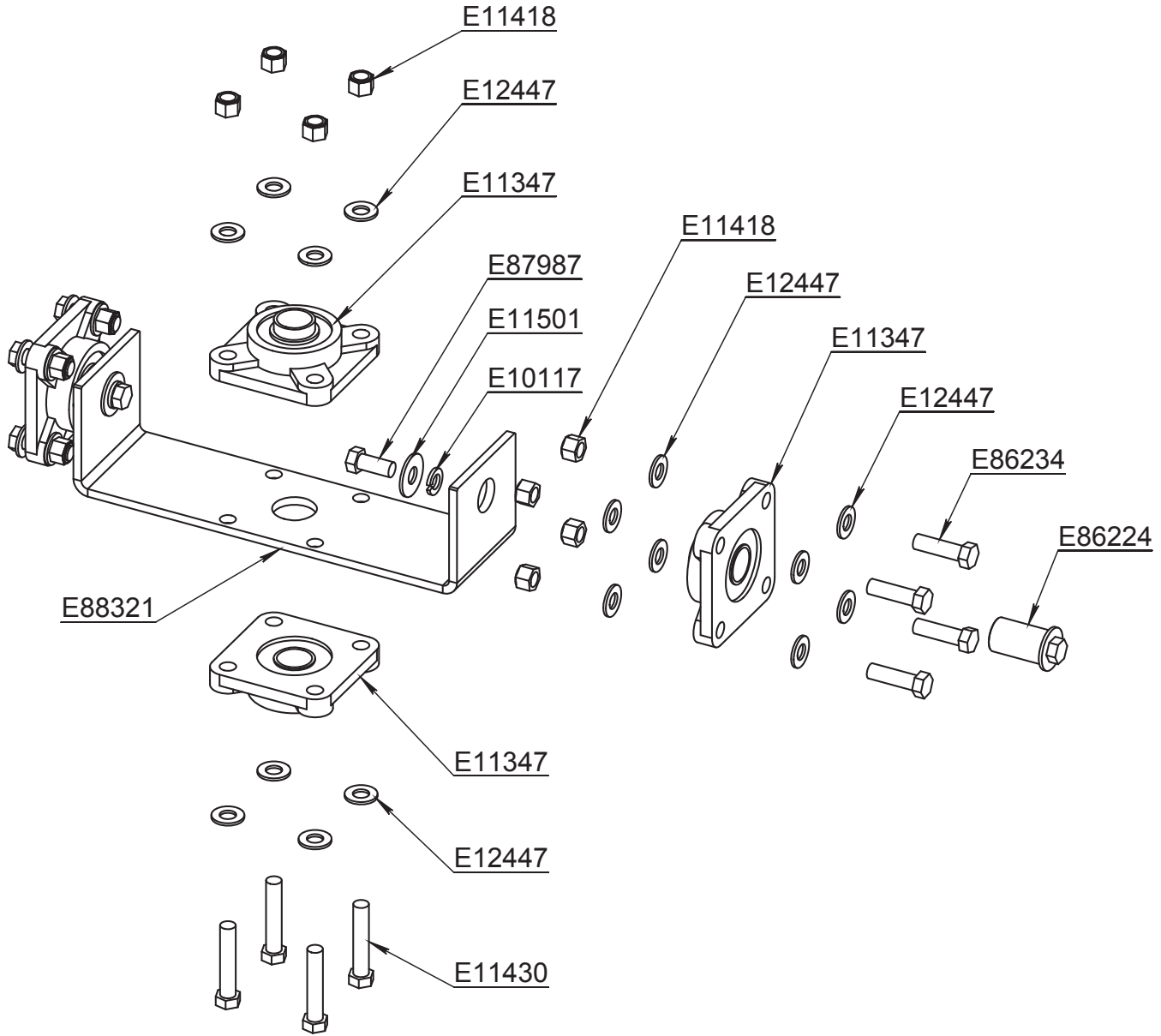
| PART NUMBER | Description | QTY. |
|-------------|---|------|
| E10117 | Washer, 7/16" Split Lock, Zinc | 1 |
| E10598 | Screw 7/16"-20 x 1.750 Hex Head, Grade 5, Zinc | 1 |
| E11289 | Key 1/4" x 1/4" x 1.500" | 1 |
| E11345 | Belt, B44 V-Belt, 44" | 1 |
| E11350 | Pulley, BK90H - 8.75 OD | 1 |
| E11417 | Tensioner Large For Engine | 1 |
| E11501 | Washer, 7/16" USS, Zinc | 4 |
| E12400 | Bushing, QT 25mm Taper Lock | 1 |
| E12406 | Screw, 1/2"-13 x 1.750 Hex Head, Grade 5, Zinc | 1 |
| E12409 | Washer, 1/2" Split Lock, Zinc | 1 |
| E12434 | Clutch, Centrifugal 1750 RPM 4" Dia. | 1 |
| E12447 | Washer, 7/16" SAE, Zinc | 1 |
| E12459 | Key 8mm x 7mm x 30mm | 1 |
| E81064 | Screw, 1/4"-20 x 0.750 Hex Head, Grade 5, Zinc | 2 |
| E81078 | Washer, 1/4" Split Lock, Zinc | 2 |
| E86232 | Spacer, Clutch Strip Kaw Top 1.000 ID x 0.470 L | 1 |

Note: Not available for purchase assembled.



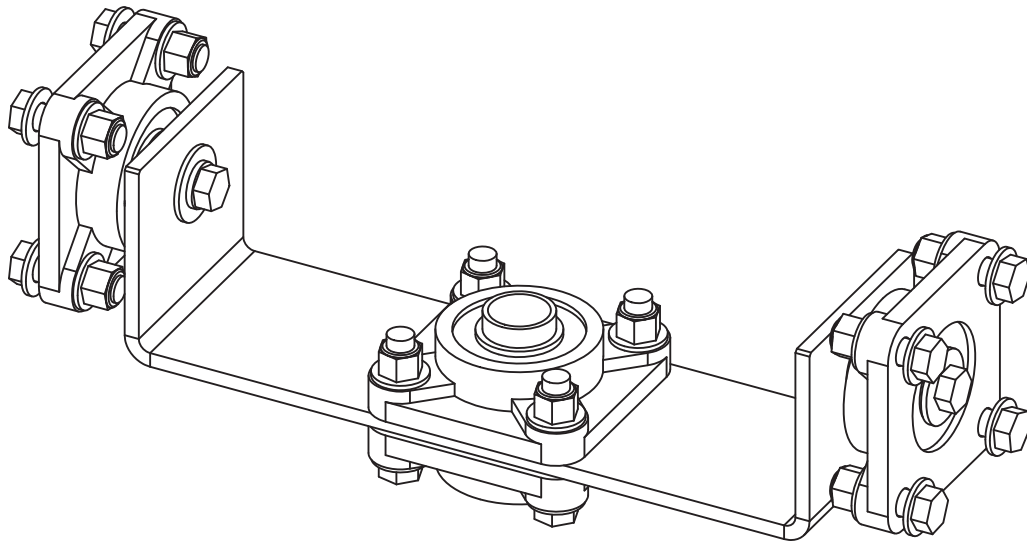
PIVOT BRACKET ASSEMBLY

(For Serial Numbers Before 6999)



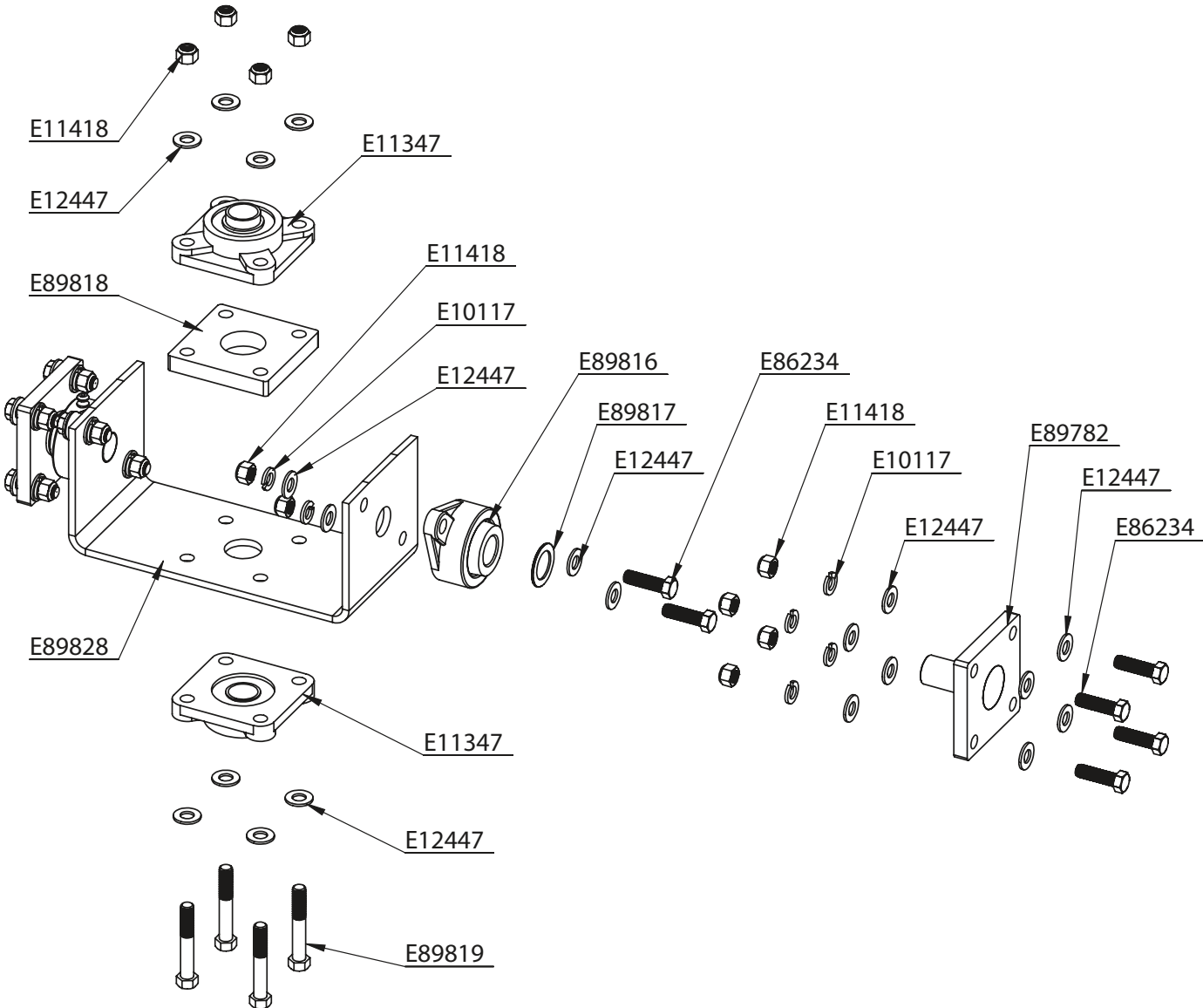
| PART NUMBER | Description | QTY. |
|-------------|---|------|
| E10117 | Washer, 7/16" Split Lock, Zinc | 2 |
| E11347 | Flange Bearing AMI UCF 205 Set Screws 2.75 Bolt Spacing | 4 |
| E11418 | Nut, 7/16"-14, Nylon Lock, Grade 5, Zinc | 12 |
| E11430 | Screw, 7/16"-14 x 2.250 Hex Head, Grade 5, Zinc | 4 |
| E11501 | Washer, 7/16" USS, Zinc | 2 |
| E12447 | Washer, 7/16" SAE, Zinc | 24 |
| E86224 | Axle, Pivot, 25mm OD x 2.0" L | 2 |
| E86234 | Screw, 7/16"-14 x 1.500 Hex Head, Grade 5, Zinc | 8 |
| E87987 | Screw, 7/16"-14 x 1.000 Hex Head, Grade 5, Zinc | 2 |
| E88321 | Pivot Bracket | 1 |

Note: Not available for purchase assembled.



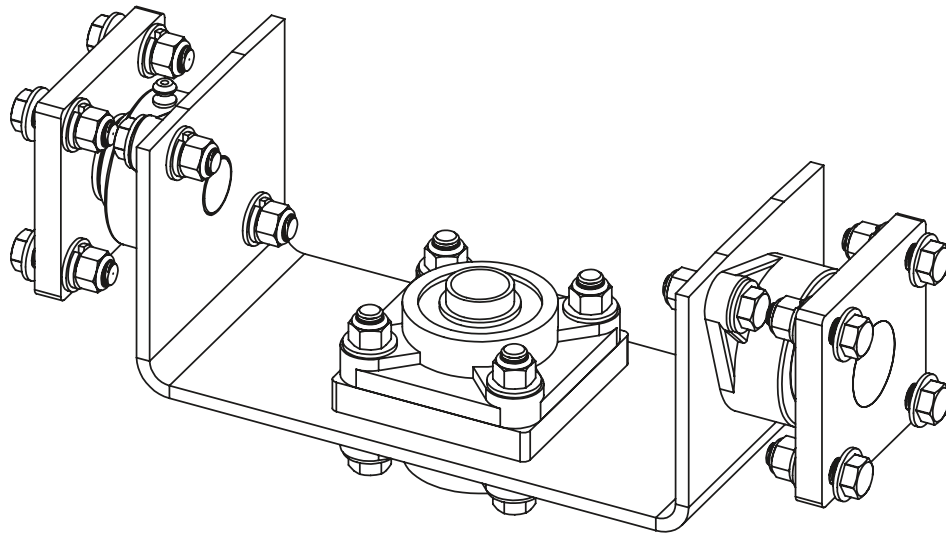
PIVOT BRACKET ASSEMBLY

(For Serial Numbers 7000 and Greater)

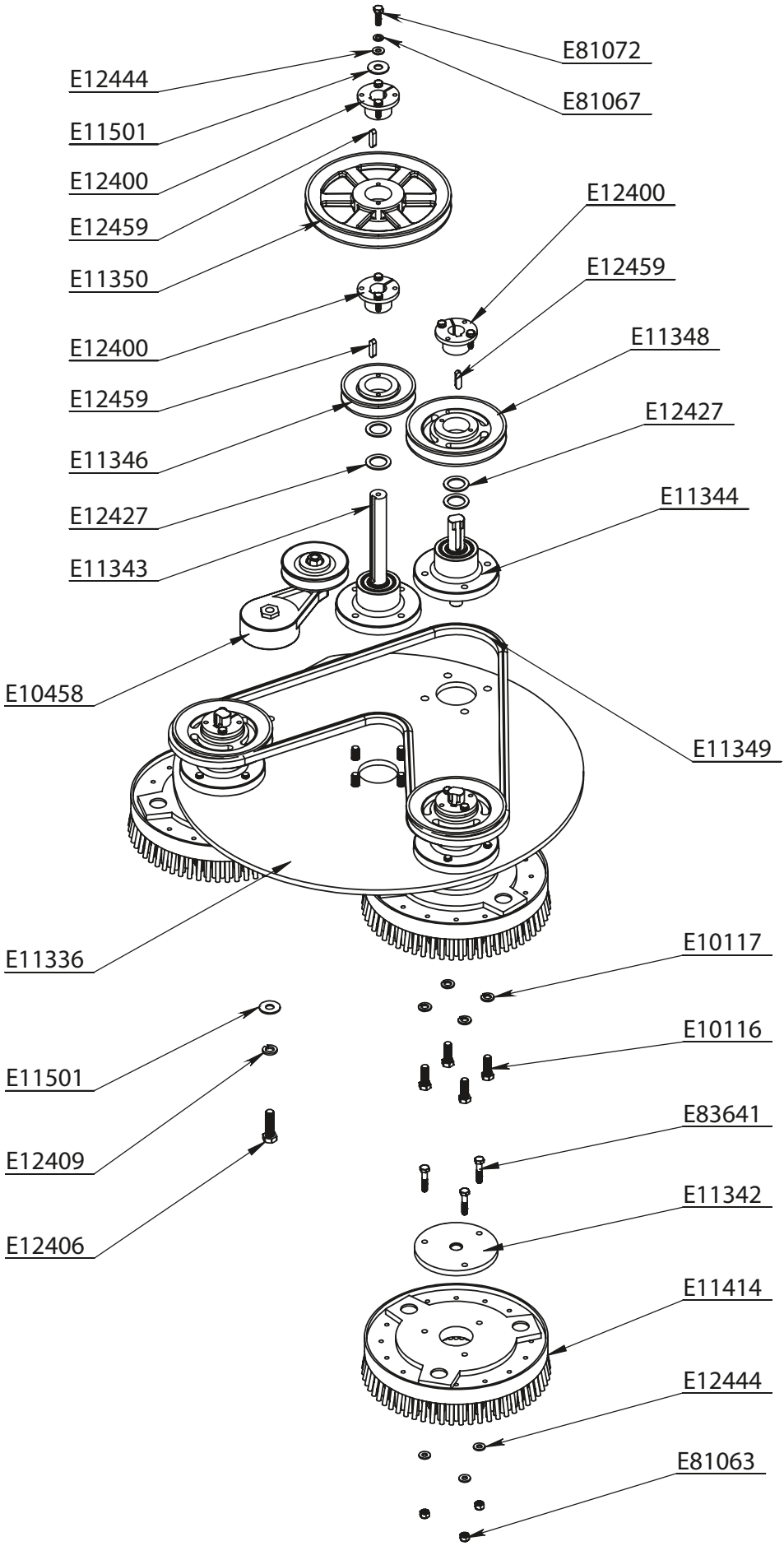


| PART NUMBER | DESCRIPTION | QTY. |
|-------------|---|------|
| E10117 | SPLIT LOCK WASHER 7/16 | 12 |
| E11347 | FLANGE BEARING AMI UCF 205 SET SCREWS 2.75 BOLT SPACING | 2 |
| E11418 | NYLOC NUT 7/16-14 | 16 |
| E12447 | FLAT WASHER, 7/16, SAE | 32 |
| E86234 | HEX HEAD SCREW 7/16-14 x 1-1/2 | 12 |
| E89782 | PIVOT BASE ASM | 2 |
| E89816 | FLANGE-MOUNTED STEEL BALL BEARING, 1" SHAFT DIAMETER | 2 |
| E89817 | BRONZE THRUST BEARING 1" I.D. X 1-1/2" OD X 1/16" T | 2 |
| E89818 | CENTER SHAFT SPACER | 1 |
| E89819 | HEX BOLT 0.4375-14 x 2.75 LG | 4 |
| E89828 | PIVOT BRACKET | 1 |

Note: Not available for purchase assembled.

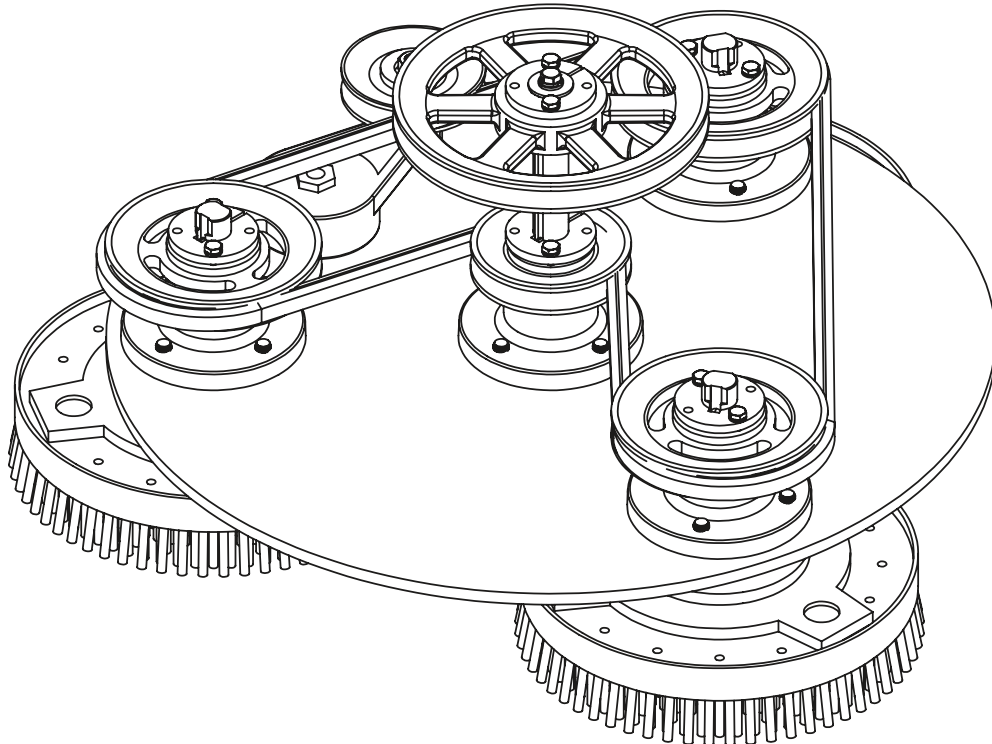


BRUSH PLATE ASSEMBLY



| PART NUMBER | DESCRIPTION | QTY. |
|-------------|------------------------------------|------|
| E10116 | HEX HEAD SCREW 7/16-14 x 1-1/4 LG | 16 |
| E10117 | SPLIT LOCK WASHER 7/16 | 16 |
| E10458 | TENSIONER LARGE FOR BRUSHES | 1 |
| E11336 | BRUSH MOUNTING PLATE | 1 |
| E11342 | BRUSH MOUNTING PLATE LH | 3 |
| E11343 | STRIPPER CENTER DRIVE HUB ASSEMBLY | 1 |
| E11344 | STRIPPER BRUSH DRIVE HUB ASSEMBLY | 3 |
| E11346 | PULLEY, BK47H - 4.45 OD | 1 |
| E11348 | PULLEY, BK62H - 5.95 OD | 3 |
| E11349 | BELT, BB77 DOUBLE V-BELT 77" | 1 |
| E11350 | PULLEY, BK90H - 8.75 OD | 1 |
| E11414 | STRIP BRUSH 11" FLARED 2" HOLE | 3 |
| E11501 | WASHER, 7/16 USS, ZINC | 2 |
| E12400 | BUSHING, PULLEY, D25MM QT25MM | 5 |
| E12406 | HEX HEAD BOLT 1/2-13 x 1-3/4 Lg | 1 |
| E12409 | WASHER, 1/2 SPLIT LOCK | 1 |
| E12427 | WASHER 1 ID x 14 GAUGE | 8 |
| E12444 | FLAT WASHER, 5/16" SAE | 10 |
| E12459 | MACHINE KEY 8mm x 7 mm x 30mm | 5 |
| E81063 | NYLOC HEX NUT 5/16-18 ZINC | 9 |
| E81067 | LOCK WASHER 5/16 | 1 |
| E81072 | HEX HEAD SCREW 5/16-18 x 1.00 Lg | 1 |
| E83641 | HEX HEAD BOLT, 5/16-18 x 1-1/2 Lg | 9 |

Note: Not available for purchase assembled.



ENGINE MAINTENANCE

KAWASAKI FS481V

| PERIODIC MAINTENANCE PLEASE REFER TO ENGINE OWNERS MANUAL FOR MORE INFORMATION | DAILY | EVERY 25 HOURS | EVERY 50 HOURS | EVERY 100 HOURS | EVERY 200 HOURS |
|---|-------|----------------------|----------------------|-----------------------|-----------------------|
| Check engine oil level and add if needed | * | | | | |
| Check and clean engine intake foam and intake paper filter | * | | | | |
| Check and clean engine cooling air intake filter | * | | | | |
| General check for loose or lost nuts, screws, oil leakage, fuel hose connection, etc. | * | | | | |
| Clean air intake foam filter | | * | | | |
| Clean air intake paper filter | | * | | | |
| Check belt tension | | * | | | |
| Change engine oil | | | * | | |
| Change oil filter | | | | * | |
| Clean dust and dirt from cylinder and cylinder head cooling fins | | | | * | |
| Tighten nuts and screws | | | | * | |
| Clean and regap sparkplugs | | | | * | |
| Replace air intake foam filter | | | | | * |
| Replace air intake paper filter | | | | | * |
| Replace spark plugs | | | | | * |
| Check and adjust valve clearance | | | | | * |
| Clean combustion chamber | | | | | * |
| Clean and lap valve seating surface | | | | | * |

IMPORTANT NOTES:

- 1) Change engine oil and oil filter after first 8 hours of operation
- 2) Maintenance should be done by qualified personnel only
- 3) Change foam and paper air intake filters and spark plugs after first 25 hours of operation

MAIN DRIVE BELT

Removal

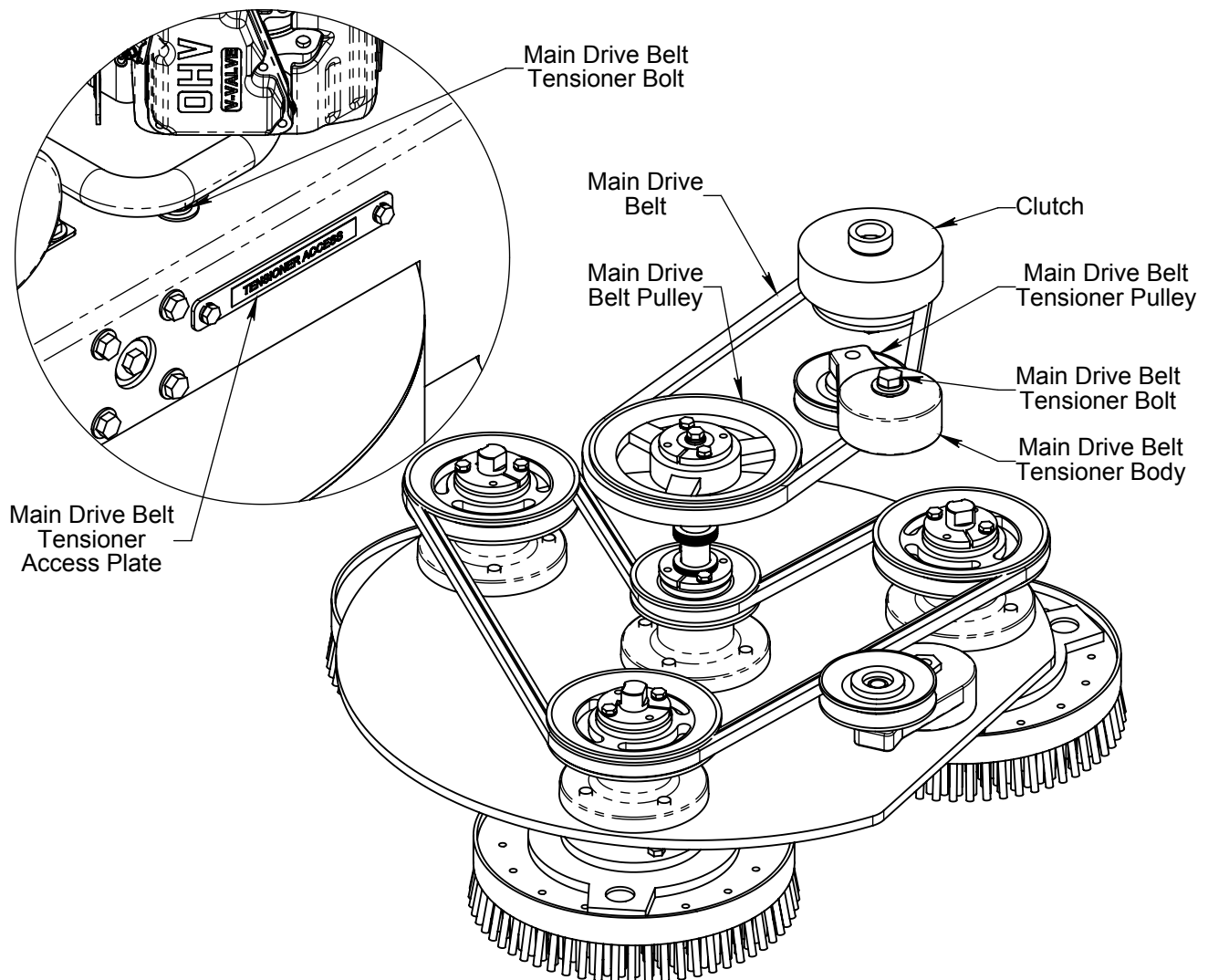
1. Remove main drive belt tensioner access plate.
2. Remove front access panel bolts and panel.
3. Loosen main drive belt tensioner bolt using a 3/4" wrench.
4. Through the front access slip the belt up over the main drive pulley of the brush drive plate.
5. You can finish removing the main drive belt through the rear opening of the machine under the handle.

Installation

1. Insert the new main drive belt through the rear opening of the machine under the handle.
2. Place the main drive belt around the clutch while ensuring the main drive belt tensioner pulley is in the correct location.
3. Put the opposite end of the main drive belt on top of the main drive belt pulley of the brush drive plate.
4. Through the front access finish inserting the main drive belt into the main drive belt pulley groove.

Tensioning

1. Insert a 1" wrench into the tensioner access slot onto the main drive belt tensioner hex on the main drive belt tensioner body.
2. Pull the wrench toward the front of the machine to tension the main drive belt.
3. While holding the 1" wrench in place tighten the main drive belt tensioner bolt with a 3/4" wrench.
4. Reposition the 1" wrench to add more tension to the main drive belt.
5. While holding the 1" wrench in place then loosen the main drive belt tensioner bolt with the 3/4" wrench.
6. Repeat steps 2 and 3.
7. Repeat steps 5 and 6 until the main drive belt is tensioned properly. (2 or 3 repetitions)



BRUSH PLATE & BELT

Brush Drive Plate Removal

1. Remove front access panel bolts and panel.
2. Loosen main drive belt tensioner bolt using a 3/4" wrench.
3. Through the front access slip the main drive belt up over the main drive pulley of the brush drive plate.
4. Remove pivot bracket axle bolts.
5. Slide pivot bracket axles out from both sides.
6. Tilt machine back at handle and pull backward until it clears the brush drive unit.

Brush Drive Belt Removal

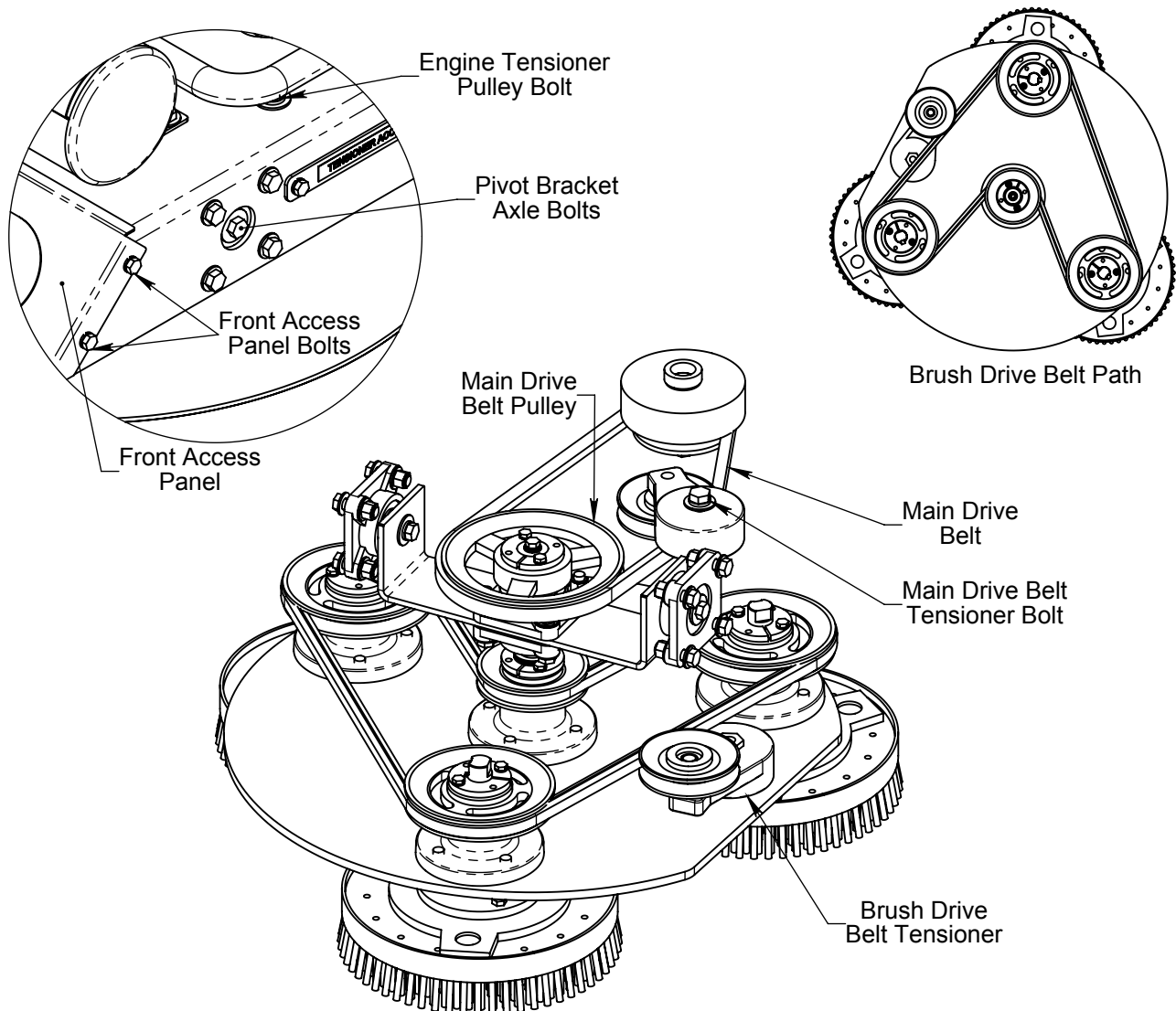
1. Loosen brush drive belt tensioner pulley bolt, located on brush side of plate, using a 3/4" wrench.
2. Slide the belt off one of the three brush pulleys.
3. Finish removing the belt from the rest of the pulleys.

Brush Drive Belt Installation

1. Place the new belt around the center pulley as shown below.
2. Now route the belt around each of the brush drive pulleys as shown below.

Brush Drive Belt Tensioning

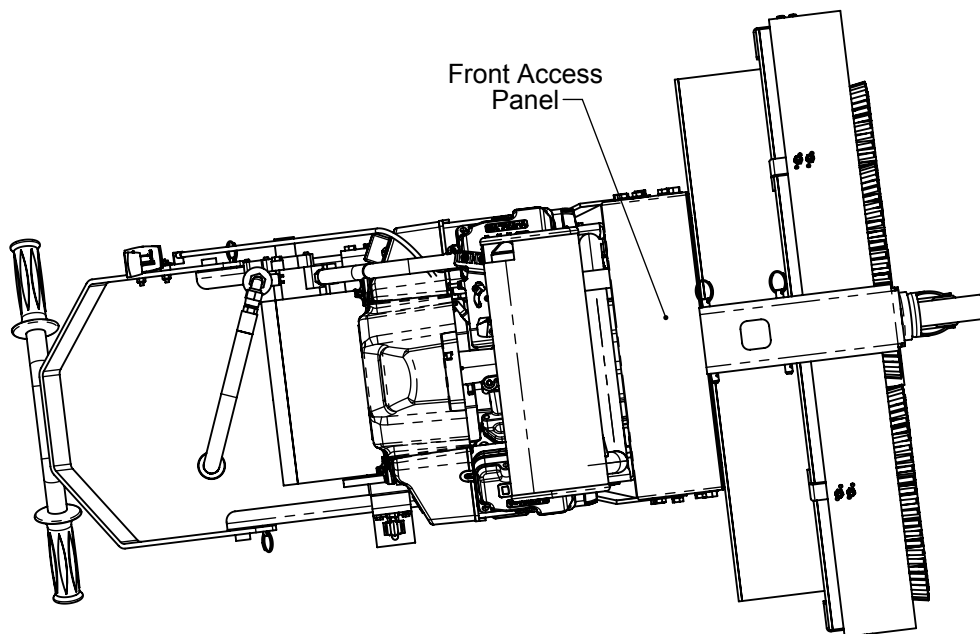
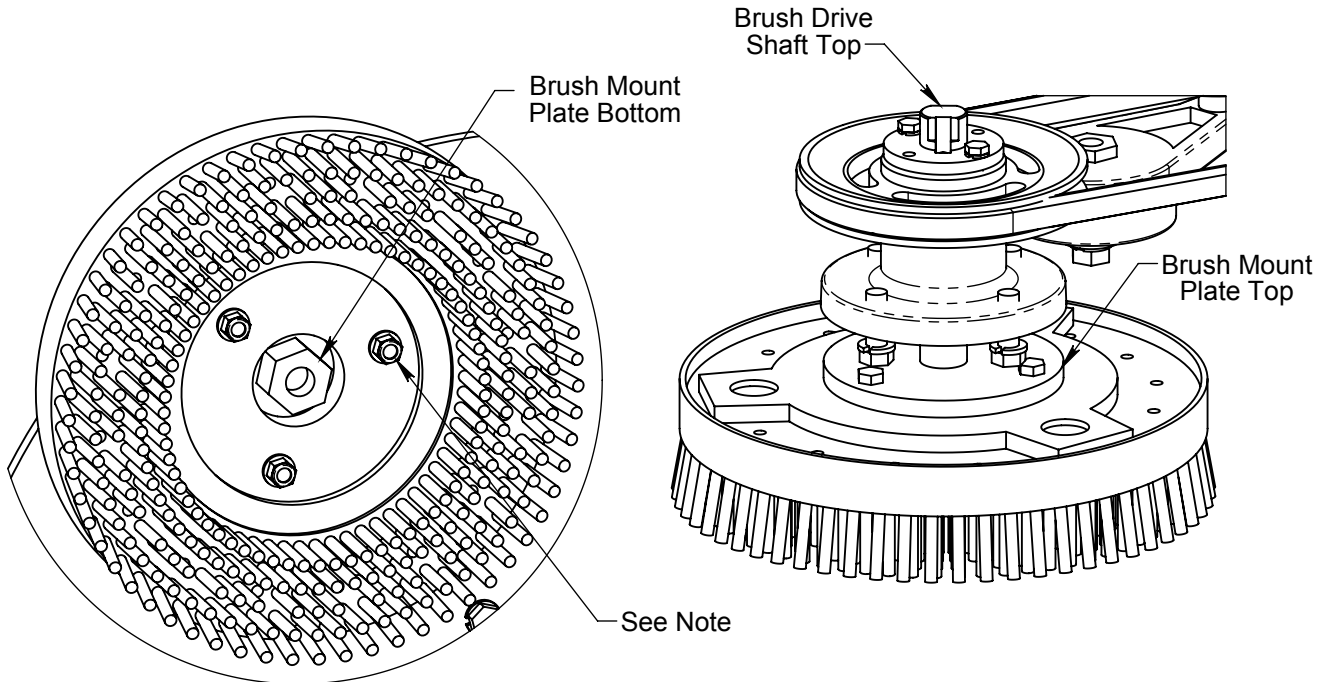
1. Place a 1" wrench on the tensioner hex on the top of the brush drive belt tensioner body.
2. Pull the wrench toward the brush drive belt tensioner pulley to tension the belt.
3. While holding the 1" wrench in place tighten the brush drive belt tensioner bolt, on the brush side of the plate, using a 3/4" wrench.



BRUSH CHANGE

1. Remove propane tank.
2. Remove front access panel to gain access to the brush drive shaft tops.
3. Lay the machine on its side with the brush drive plate installed.
4. The brush drive shaft and brush mount plate are LEFT HAND THREADS.
5. Using a 3/4" open end wrench place it on the wrench flats of the brush drive shaft top.
6. Place an 1 1/4" socket in the center of the brush mount plate on the bristle side.
7. Unscrew the brush mount plate from the brush drive shaft while securing the brush drive shaft with the 3/4" wrench.
8. Now you'll need to remove the brush from the brush mount plate.
9. Using a 1/2" wrench and 1/2" socket unscrew the nuts which hold the brush onto the brush mount plate.

Note: When reassembling brush and brush mounting plate place bolts in through the brush mount plate down through brush and put nuts on the bristle side of the brush.



TROUBLESHOOTING

| PROBLEM | CAUSE | POSSIBLE SOLUTION |
|---|--|--|
| Engine will not turn over | Battery is dead | Recharge battery or replace if necessary |
| | Loose wire or bad connection | Check wires and connections |
| | Bad electrical component | Replace bad component |
| | Fuel system problem | Refer to engine owner's manual and read IMPORTANT below |
| Engine turns over, but will not start | Propane tank shut off valve in off position | Open propane tank shut off valve completely |
| | Low oil | Add oil |
| | Fuel system problem | Refer to engine owner's manual and read IMPORTANT below |
| | Propane tank empty | Fill propane tank |
| | Engine problem | Refer to engine owner's manual and read IMPORTANT below |
| Hard to start | Throttle lever in slow position | Push throttle lever to fast position |
| | Propane tank shut off valve not fully open | Open propane tank shut off valve completely |
| | Some type of engine problem | Refer to engine owner's manual and read IMPORTANT below |
| Engine stops suddenly and will not restart | Out of propane | Replace propane tank with full propane tank |
| | Low oil | Add oil |
| Engine overheats | Intake air filter is dirty | Remove air intake filter and clean |
| | Incorrect oil level | Add or remove oil to achieve proper oil level |
| Can't remove brushes | Turning brushes the wrong direction | Turn clockwise to remove. Threads are LEFT HAND |
| Poor stripping performance or leaves wax on the floor | Brushes worn and have 3/4" bristle length or less | Change the brushes |
| | Brush or main drive belt slipping | Tension belts or replace belts if worn out |
| | Problem with stripper | Check dilution ratio or try alternative stripper |
| Excessive splashing | Splash guard too high off floor | Adjust splash guard down |
| Solution pushed by splash guard | Splash guard too low | Adjust splash guard up |
| Brushes not turning, turning slow or smell burning rubber | Brush or main drive belt slipping | Tension belts or replace belts if worn out |
| | Floor too rough to overcome friction, may happen on rough concrete surface | Check belts for proper tensioning or for excessive wear and ensure there is plenty of liquid on the floor. |
| Lacks power | Some type of engine problem | Refer to engine owner's manual and read IMPORTANT below |
| Engine stops and will restart, but stops again | Emission shut-down system engaged | Refer to engine owner's manual and read IMPORTANT below |
| Nothing here fixes the problem | Problem could have several causes | Read IMPORTANT below |

IMPORTANT: Propane fueled combustion engines produce dangerous gases and must be serviced by authorized service personnel trained specifically to service propane fueled engines and fuel systems. The troubleshooting tips are not intended to take the place of authorized service personnel. If you are unsure of what to do contact an authorized service personnel. Before working on this machine you must be familiar with the safety instructions in this manual.

EMISSION CONTROL WARRANTY STATEMENT

YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Betco Corporation are pleased to explain the emissions control system warranty on your small off-road engine (SORE). In California and the other 49 States, new SORE must be designed, built and equipped to meet stringent anti-smog standards. Betco Corporation must warrant the emission control system on your SORE for the period of time listed below provided there has been no abuse, neglect or improper maintenance of your SORE.

Your emission control system may include parts such as the carburetor, fuel-injection system, the ignition system, catalytic converter, fuel tanks, fuel lines, fuel caps, valves, canisters, filters, vapor hoses, clamps, connectors, and other associated emission-related components.

Where a warrantable condition exists, Betco Corporation will repair your SORE at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE

The emission control system is warranted for two years. If any emission-related part on your equipment is defective, the part will be repaired or replaced by Betco Corporation.

OWNER'S WARRANTY RESPONSIBILITIES

As the small off-road engine (SORE) owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Betco Corporation recommends that you retain all receipts covering maintenance of your SORE engine, but Betco Corporation cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the SORE owner you should however be aware that Betco Corporation may deny your warranty if your SORE or its part has failed due to abuse, neglect, improper maintenance or unapproved modification.

You are responsible for presenting your utility equipment engine to a Betco Corporation distribution center as soon as the problem exists. The warranty repairs should be completed within a reasonable amount of time, not to exceed 30 days. If you have any questions regarding your warranty rights and responsibilities, you should contact Betco Corporation at 1-888-GO-BETCO (1-888-462-3826).

Betco Corporation
1001 Brown Ave.
P.O. Box 3127
Toledo, Ohio 43607
USA

GENERAL EMISSIONS WARRANTY COVERAGE

Betco Corporation warrants to the ultimate purchaser and each subsequent purchaser that the equipment is designed, built and equipped so as to conform with all applicable regulations; and free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to that part as described in Betco Corporation's application for certification.

The warranty period begins on the date the equipment is delivered to an ultimate purchaser or first placed into service. The warranty period is two years.

Subject to certain conditions and exclusions as stated below, the warranty on emission-related parts is as follows:

1. Any warranted part that is not scheduled for replacement as required maintenance in the written instructions supplied, is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Betco Corporation according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period.
2. Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.

EMISSION CONTROL WARRANTY STATEMENT

3. Any warranted part that is scheduled for replacement as required maintenance in the written instructions supplied is warranted for the period of time before the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, the part will be repaired or replaced by Betco Corporation according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
4. Repair or replacement of any warranted part under the warranty provisions herein must be performed at a warranty station at no charge to the owner.
5. Notwithstanding the provisions herein, warranty services or repairs will be provided at all of our distribution centers that are franchised to service the subject engines or equipment.
6. The SORE owner will not be charged for diagnostic labor that is directly associated with diagnosis of a defective, emission-related warranted part, provided that such diagnostic work is performed at a warranty station.
7. Betco Corporation is liable for damages to other engine or equipment components proximately caused by a failure under warranty of any warranted part.
8. Throughout the SORE warranty period stated above, Betco Corporation will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
9. Any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Betco Corporation.
10. Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claims. Betco Corporation will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

WARRANTED PARTS

The repair or replacement of any warranted part otherwise eligible for warranty coverage may be excluded from such warranty coverage if Betco Corporation demonstrates that the SORE has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part. That notwithstanding, any adjustment of a component that has a factory installed, and properly operating, adjustment limiting device is still eligible for warranty coverage. The following emission warranty parts are covered:

1. Fuel system: carburetor, pressure regulator, and fuel lock off
2. Ignition system: spark plug, ignition coil assembly, and voltage regulator
3. Intake system: intake manifold and air filter
4. Exhaust system: exhaust manifold and catalytic converter
5. Miscellaneous items used in above systems: hoses, connectors, and assemblies.

BETCO US WARRANTY POLICY

10 year coverage

Subject to the conditions stated below, Betco warrants parts and labor on rotationally molded polyethylene tanks/housings and injection molded vacuum head assemblies to be free from defects in materials and workmanship for a period of ten years to the original purchaser.

3 Year Coverage

Subject to the conditions stated below, Betco warrants parts and labor on all other Betco components to be free from defects in materials and workmanship for a period of three years to the original purchaser.

1 Year Coverage

Subject to the conditions stated below, Betco offers a limited warranty on parts and labor on the following equipment: parts and accessories to be free from defects in materials and workmanship for a period of one year to the original purchaser.

- HF14 Upright Vacuum: #E88820-00
- Bac Pac Lite Vacuum: #85903-00
- FiberPRO® Floor Dryer: #85507-00
- WORKMAN™ Series Vacuums: #85024-00, #85025-00, #83012-00, #85027-00
- CV100T Vacuum: #85023-00
- All Tools and Accessories
- All Battery Chargers
- All Batteries are pro-rated for 1 year

Allowable Travel Time Warranty Reimbursement:

Eligible equipment: All battery and propane powered equipment products. Warranty period: 90 days from date of sale to the original purchaser. A maximum 180 mile round trip at 50 cents per mile will be allowed for warranty consideration.

Propane Machine Warranty:

Kawasaki engines are warranted by Kawasaki for a period of 2 years against manufacturer defects. All other components (except wear items)* are warranted by Betco for a period of 3 years.

***Wear Items exempt from Warranty consideration include but may not be limited to: power cords, transport wheels, vacuum bags, belts, squeegee blades, pad drivers, clutch plates, handle grips, filters, screens, throttle cables, brushes and carbon brushes.**

Subject to the conditions and exceptions stated in this warranty, Betco warrants the Betco products to be free from defects in material and workmanship, under normal use and service, for the periods listed under the warranty policy to the original purchaser. At any time during the warranty period, Betco will furnish replacement parts for the Betco parts to the original purchaser. Such parts will be furnished and charged including transportation costs, to the original owner through any Betco authorized Service Distributor. If the original part is returned within the warranty policy period from date of delivery for inspection by Betco and is found to be defective the owner will be credited for the cost of replacement parts plus shipping and handling. Replacement parts that have become defective through wear or abuse are not included in this warranty.

This warranty does not apply to damage or defect caused by accident, misuse, negligence, fire, or to any Betco product which has been serviced or repaired by other than an authorized Betco Service Distributor or Betco factory personnel. This warranty is void if products are used for any purpose other than that which was intended. There are no other warranties expressed or implied. In no event shall Betco be liable for incidental or consequential damages or any damage to person or property. (Please note some states do not allow the exclusion or limitations for incidental and consequential damages).

