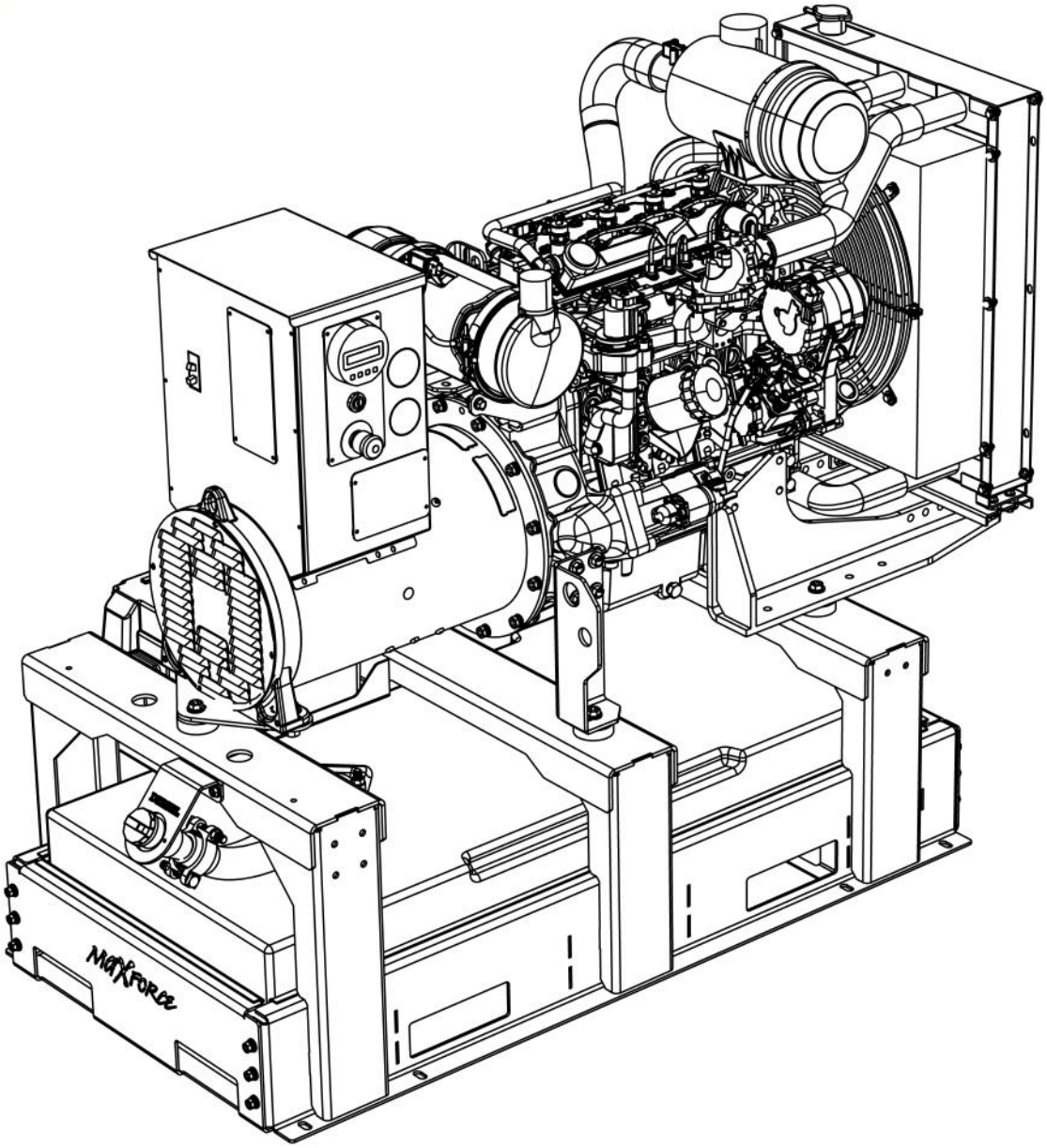
# MAXFORCE 40 kW GENERATOR

**Product Description**

GENERATOR, MAXFORCE 40KW, DOOSAN

## Operation & Parts




**M90700-30-A**

**2845 W Service Rd Eagan, MN 55121**

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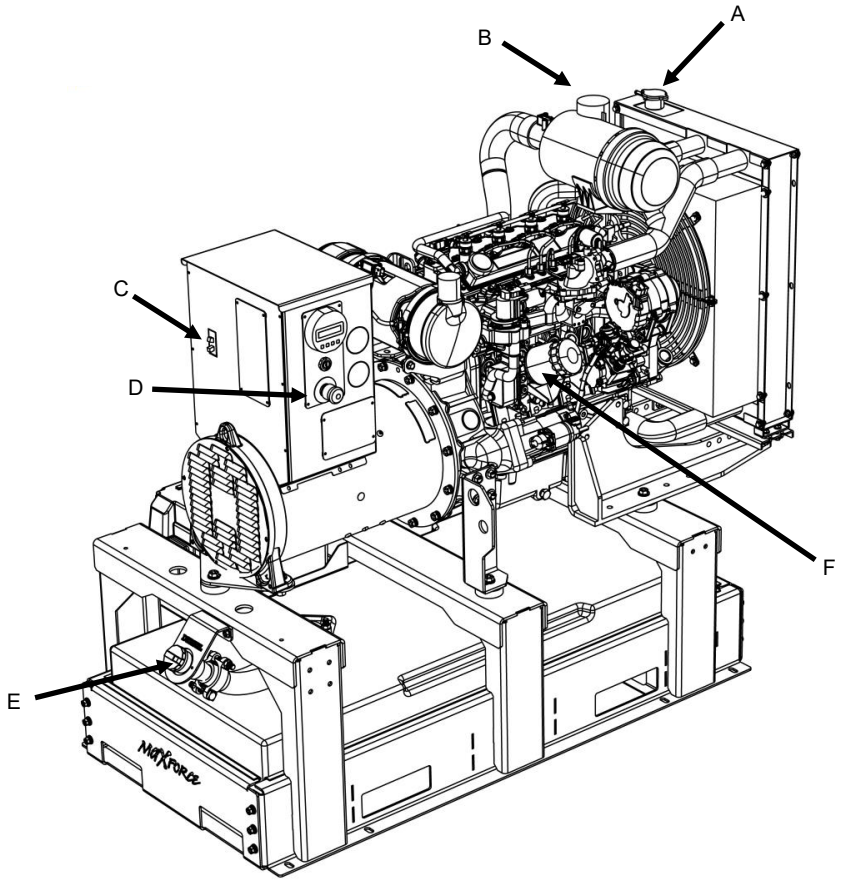
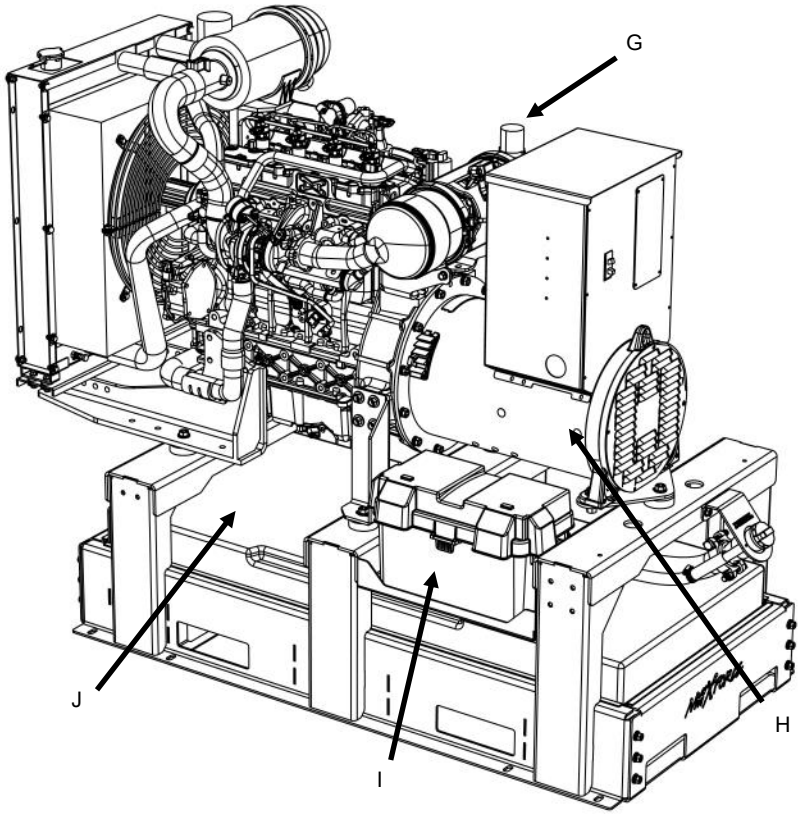
**For parts, service, and technical assistance, contact your equipment distributer:**

# Equipment Layout




| Generator Components | |
|---|---|
| A | Radiator Fill Cap |
| B | Engine Air Intake |
| C | Main Disconnect |
| D | Control Panel |
| E | Fuel Fill |
| F | Engine Oil Filter |
| G | Engine Exhaust |
| H | Alternator |
| I | 12V Battery |
| J | Fuel Tank |



# Specifications

## Generator

| | |
|---|---|
| Watts | 35,000 |
| Volts | 220 V |
| Phase | Three |
| PF | 0.8 |
| Amps | 115 A |
| Hertz | 60 Hz |

## Engine

| | |
|---|---|
| Model | Doosan D24 |
| Starting System | 12 Volt |
| Fuel | Diesel |
| Oil Type | Refer to engine manual |
| Oil Capacity | 9 QTs |
| Coolant Type | Refer to engine manual |

## Alternator

| | |
|---|---|
| Prime kVA | 49 |
| Leads | 12 |
| Voltage Regulator Type | AVR |
| Excitation System | Brushless |
| Efficiency | 88.6% @ 0.8 PF |

# Safety

## General Safety Information

**READ THE MANUAL**

- Ensure any operator of this equipment has read and understands the manual before operating.
- Do not attempt to repair or modify this equipment

**EQUIPMENT MISUSE HAZARD**

- Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.
- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your equipment distributer.
- Do not alter or modify this equipment. Use only genuine OEM parts.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations

**FUEL HAZARD**

- The fuel used in this unit is combustible and when spilled on a hot surface can ignite and cause a fire.
- Do not fill the fuel tank while the engine is running or hot.

**EXHAUST HAZARD**

- The exhaust contains poisonous carbon dioxide which is colorless and odorless.
- Do not operate this equipment in a closed building.

**FIRE AND EXPLOSION HAZARD**

- Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.
- Keep the generator area free of debris, including solvent, rags and uncontained fuel.

**NOISE HAZARD**

- Wear hearing protection when operating this

**ELECTRICAL SHOCK HAZARD**

- This equipment creates high voltage that can cause fatal electric shock.
- Do not attempt to service or repair the alternator while the engine is running.
- Be sure the equipment is properly grounded according to applicable national electrical code.

## Equipment Hazards & Warnings

**DANGER**

- Hot oil under pressure – will cause severe injury or death. Do not remove valves, caps, plugs or piping while compressor is running or pressurized.
- Hot exhaust system. Allow system to cool down before attempting to preform maintenance on engine.
- Discharge air used for breathing will cause severe injury or death. Consult your generator dealer for additional filtration to meet OSHA standards.

**WARNING**

- Read the operators manual before starting this unit. Failure to adhere to instructions can result in severe personal injury.
- E-stop button should only be used in the case of an emergency.
- On shutdown, close compressed air vented ball valve
- Drive belts in rotation. Switch off engine and disconnect battery before attempting to work or perform maintenance on the compressor package.
- Hoses under pressure. Relieve system pressure before disconnecting or replacing air and oil hoses.

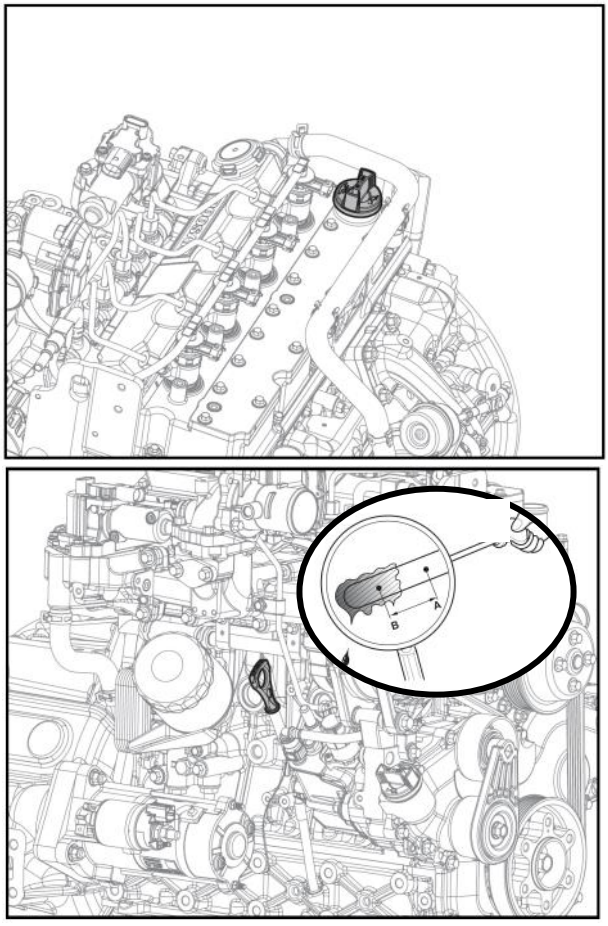
**CAUTION**

- To avoid electrical shock, disconnect battery prior to electrical system service
- High voltage present. Do not attempt to perform maintenance on alternator while engine is running.

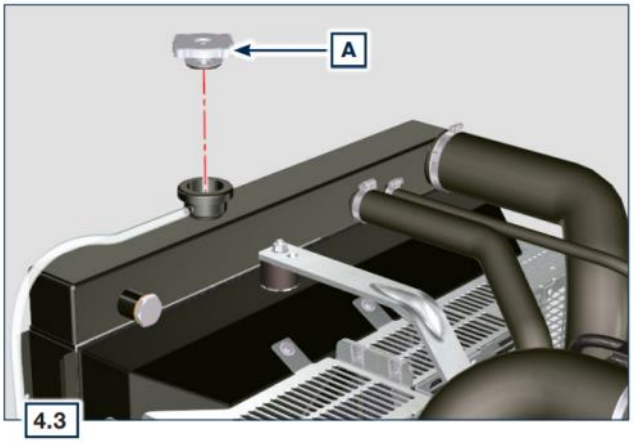
# Operation

### Pre-Start Up Inspection

Before starting generator, check the oil level in the engine and air compressor. The oil level in the engine should be between the low and high marks on the engine oil dipstick (B). If the engine is low on oil, add oil to the engine at either cap A or C. Check the oil on the oil dipstick again after filling to ensure it is at the proper level.




Engine oil fill level




Radiator cap location

**CAUTION**

- Do not remove the radiator cap when engine is hot!

Check the coolant level in the engine radiator. The coolant level should be visible once the radiator cap is removed.

Visually inspect all hoses and belts for cracks or damage. Remove any tools, rags, or other material resting on the engine alternator. Verify the main disconnect breaker is in the OFF position.

### Starting Procedure

Start the engine using the key switch on the control panel. The digital display will indicate when the engine is OK to start after the glow plugs have warmed. The engine will automatically raise from idle speed to an operating speed of 1800 rpm. Allow engine to warm up 2-5 minutes before any load is applied. Switch the main disconnect breaker to the ON position.

### Shutdown procedure

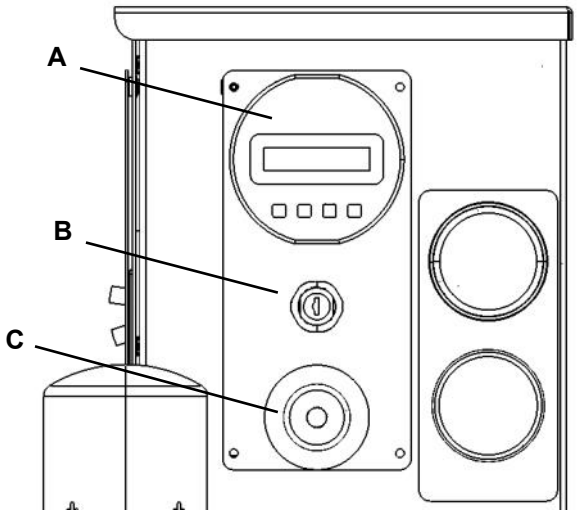
After shutting down electrical equipment, switch the main breaker to the OFF position. Allow the engine to idle for 1-2 minutes. Shut the engine down using the key switch.

***NOTICE***

**On Shutdown**

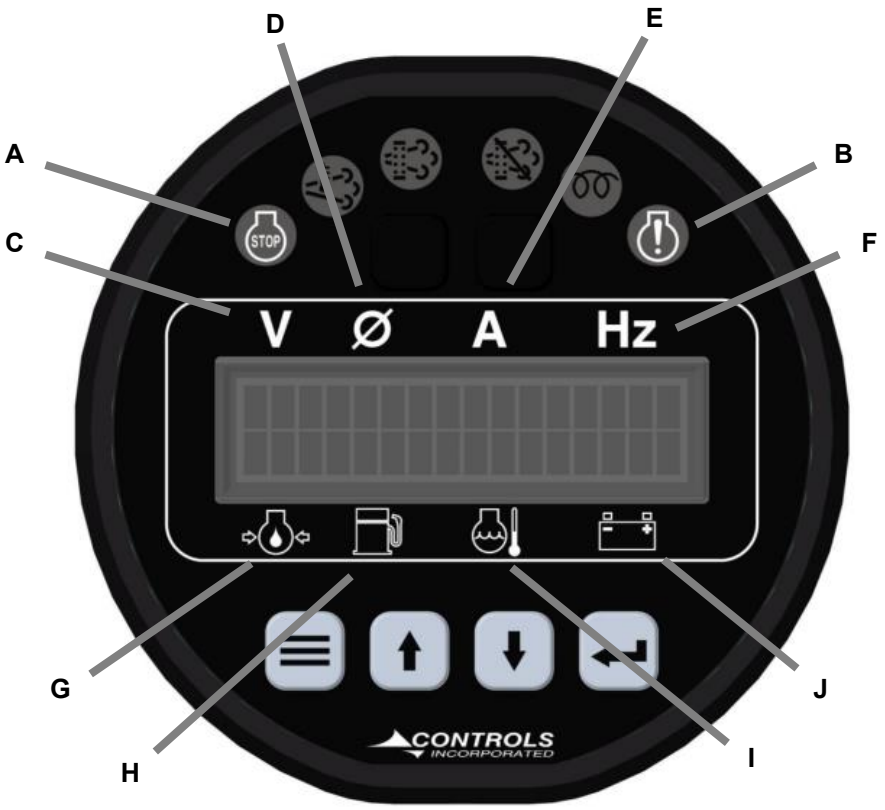
The red E-STOP pushbutton should only be used to shut down the generator in an emergency.

### Control Panel Layout




| | |
|---|---|
| A | Controller |
| B | Key Switch |
| C | E-STOP |

# Controller Layout




| | |
|---|---|
| A | Engine Shutdown Fault (Red) |
| B | Engine Warning Fault (Yellow) |
| C | Voltage On Displayed Phase |
| D | Current Phase Displayed |
| E | Amps On Displayed Phase |
| F | Generator Frequency |
| G | Engine Oil Pressure |
| H | Fuel Level |
| I | Engine Coolant Temperature |
| J | Battery Voltage |

# Maintenance

### Engine Maintenance — Doosan D24

| Item | Check | Replace | Replacement Part Number |
|---|---|---|---|
| Engine Oil | DAILY | 500 Hrs. | SEE BELOW CHART |
| Engine Oil Filter | - | 500 Hrs. | V90700-85 |
| Engine Fuel Filter | 500 Hrs. | 500 Hrs. | V90700-90 |
| Engine Air Filter (Primary) | 100 Hrs. | 500 Hrs. | V90700-91 |
| Engine Air Filter (Secondary) | 100 Hrs. | 500 Hrs. | V90700-92 |

### Maintenance Kits

| Item | Kit Number |
|---|---|
| **Doosan D24 Engine Maintenance Kit (Bi-Annual)**<br>Includes: 10W-30 oil, oil filter, air filter (primary and secondary), fuel filter | S90700-17 |

| Recommended Oil | | |
|---|---|---|
| Viscosity | SAE | 15W-40 (-15° C ÷ +50° C)<br>10W-30 (-25° C ÷ +40° C)<br>10W-40 (-25° C ÷ +50° C)<br>5W-30 (-30° C ÷ +40° C)<br>0W-40 (-40° C ÷ +50° C) |

# Troubleshooting

## Engine

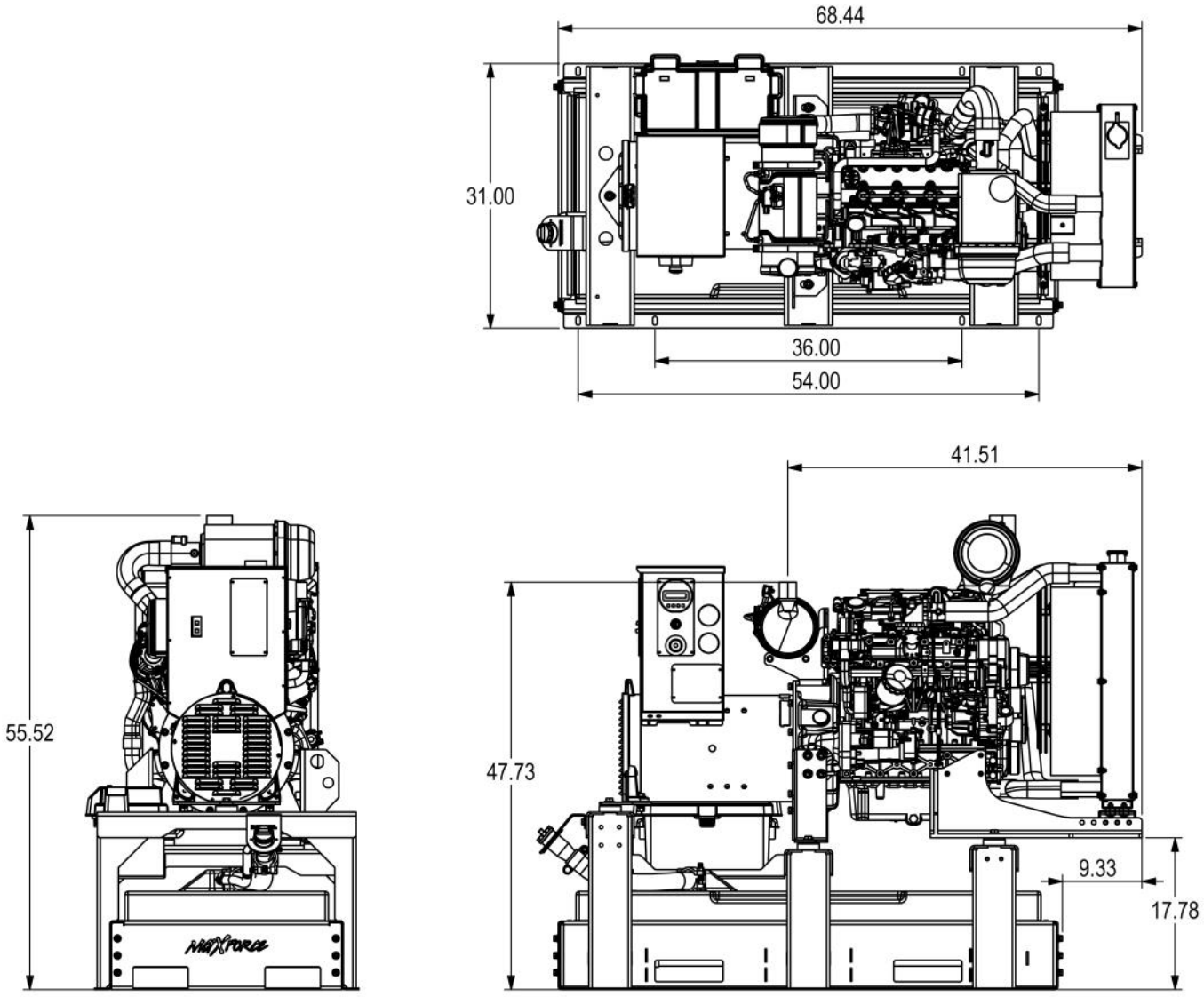
| Problem | Cause | Solution |
|---|---|---|
| The engine does not start | Sulphated battery terminals corroded | Clean the battery terminals |
| | Battery voltage too low | Recharge or replace battery |
| | Low fuel level | Refuel |
| | Frozen fuel | Contact dealer |
| | Clogged fuel filter | Replace with a new filter |
| | Air suction in fuel system | Contact dealer |
| | Clogged air filter | Replace with a new filter |
| | Clogged pipes | Contact dealer |
| | Open fuse | Relace with a new fuse |
| | Intake or exhaust system clogged | Contact dealer |
| Engine doesn’t rev up | Safety protocol in starting | Wait some seconds |
| RPM instability at idle speed | Clogged fuel pipes | Contact dealer |
| Low idle speed | Clogged fuel pipes | Contact dealer |
| | Poor quality fuel | Clean the tank and refuel with quality fuel |
| Blue smoke | High oil sump level | Replace the engine oil |
| | Clogged air filter | Replace with a new filter |
| Excessive fuel consumption | Clogged air filter | Replace with a new filter |
| | High oil sump level | Replace the engine oil |
| Engine lost its initial performance | Clogged air filter | Replace with a new filter |
| | Clogged fuel pipes | Contact dealer |
| | Cheap fuel | Clean the tank and refuel with quality fuel |
| | High oil sump level | Replace the engine oil |
| Slow acceleration | Clogged fuel filter | Replace the fuel filter |
| Engine jerking | Clogged fuel pipes | Contact dealer |
| Engine overheats | Insufficient coolant level | Fill up to the level |
| | High oil sump level | Replace the engine oil |
| | Clogged radiator | Clean the radiator |

## Alternator

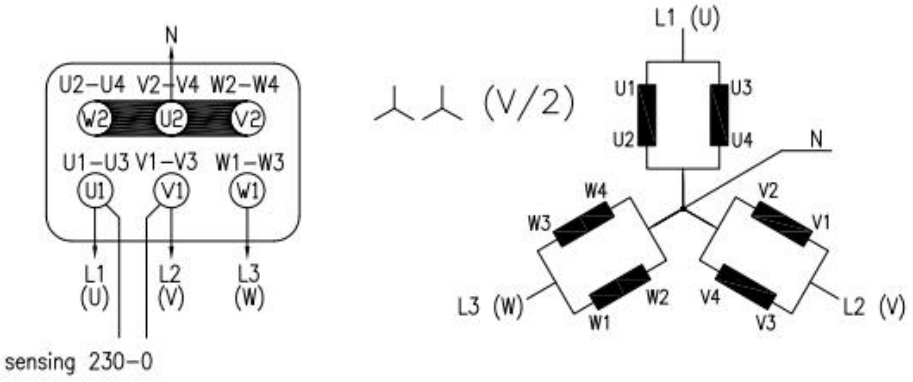
| Problem | Cause | Solution |
|---|---|---|
| NO VOLTAGE | Faulty AVR | Check the fuse<br>Replace the AVR |
| | Faulty rectifier bridge and/or surge suppressor | Check rectifier bridge |
| | Faulty stator exciter | Contact dealer |
| | Main winding fault | Contact dealer |
| | Demagnetized machine | Contact dealer |
| | Broken connections | Check all connections |
| | Reference voltage is not set at desired value | Adjust voltage with potentiometer «V» on the AVR; |
| | Under-frequency protection not properly adjusted | Check / adjust, the value of under-frequency protection for 50Hz (60Hz) nominal frequency. |
| LOW VOLTAGE | Engine speed low | Check the engine speed (voltage frequency) |
| | Faulty AVR | Replace the AVR |
| | Reference voltage is not set at desired value | Adjust voltage with potentiometer «V» on the AVR |
| | Sensing connection open circuit | Check the sensing connections |
| HIGH VOLTAGE | Faulty AVR | Replace the AVR |
| UNSTABLE VOLTAGE | AVR stability incorrectly set | Check the correct Dip switches position, adjust stability with ST trimmer |
| | Engine speed unstable | Check with the frequency meter if there are oscillations in engine speed |
| | Faulty AVR | Replace the AVR |

# Technical Data

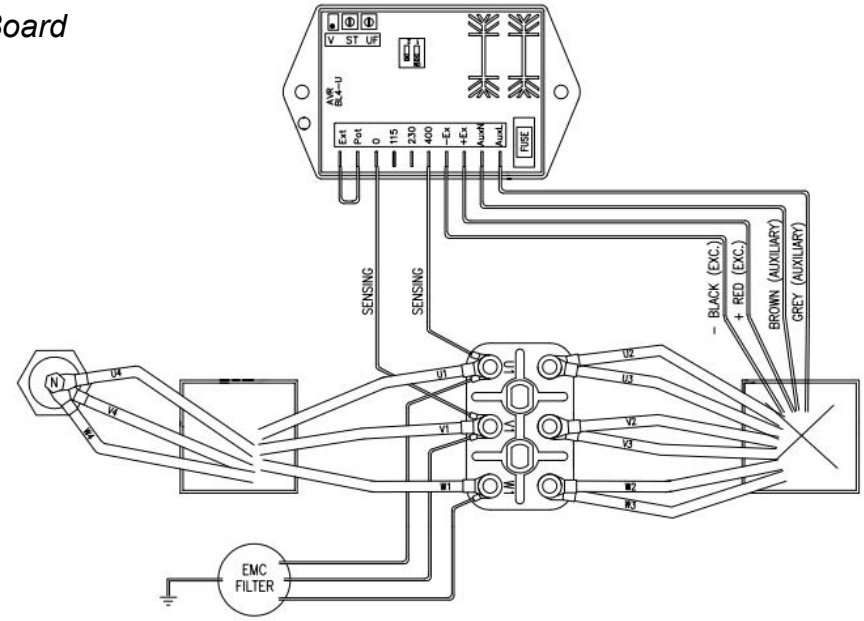
*Generator Dimensions*

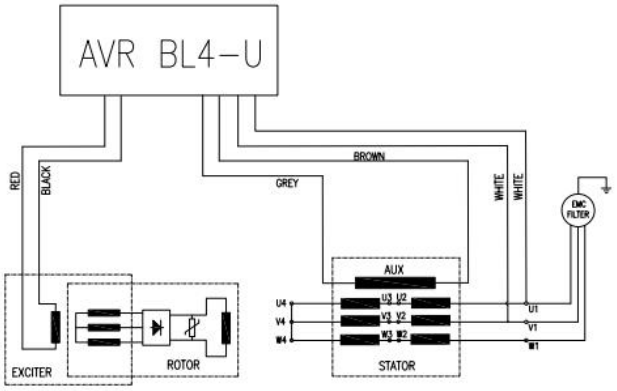


*Alternator Wiring—High Voltage*



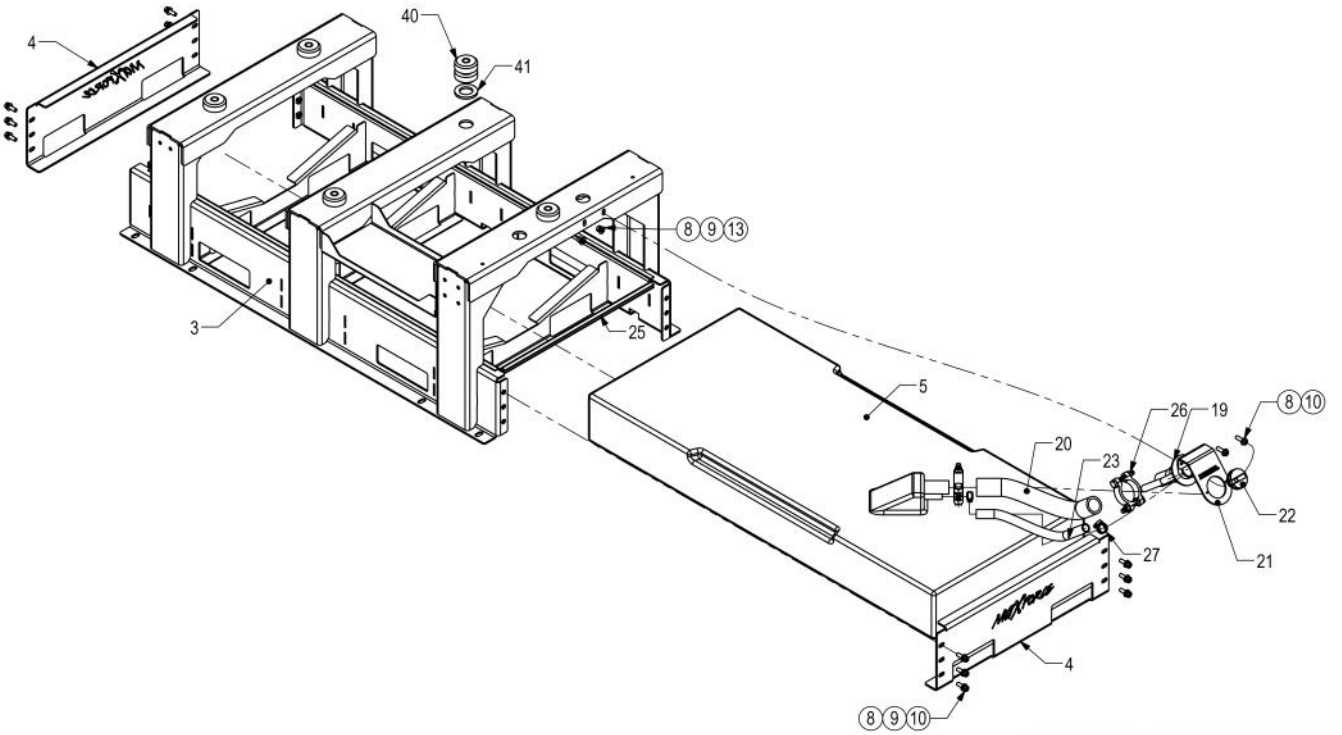

*Alternator Wiring—AVR Board*



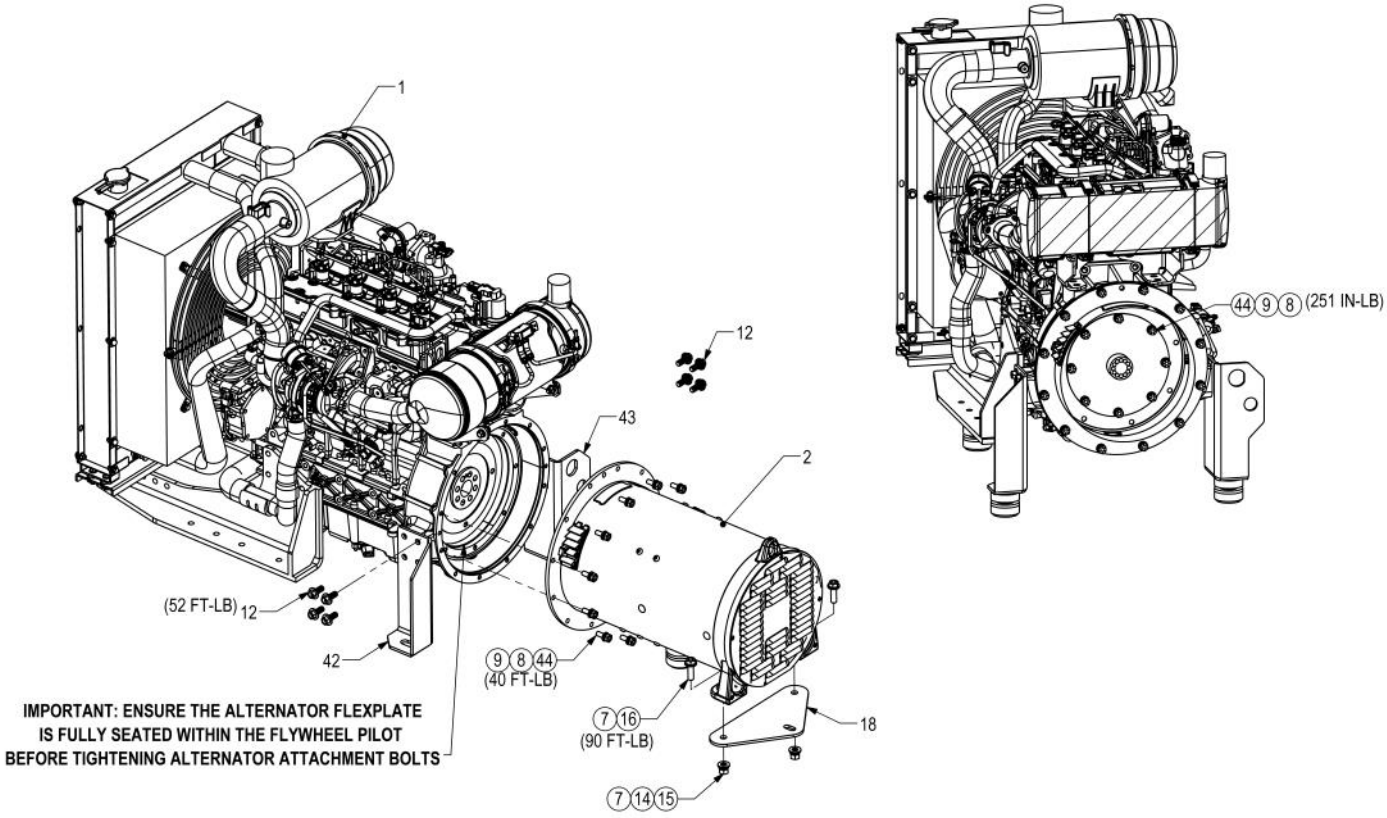
# Parts

*Frame and Fuel Tank*



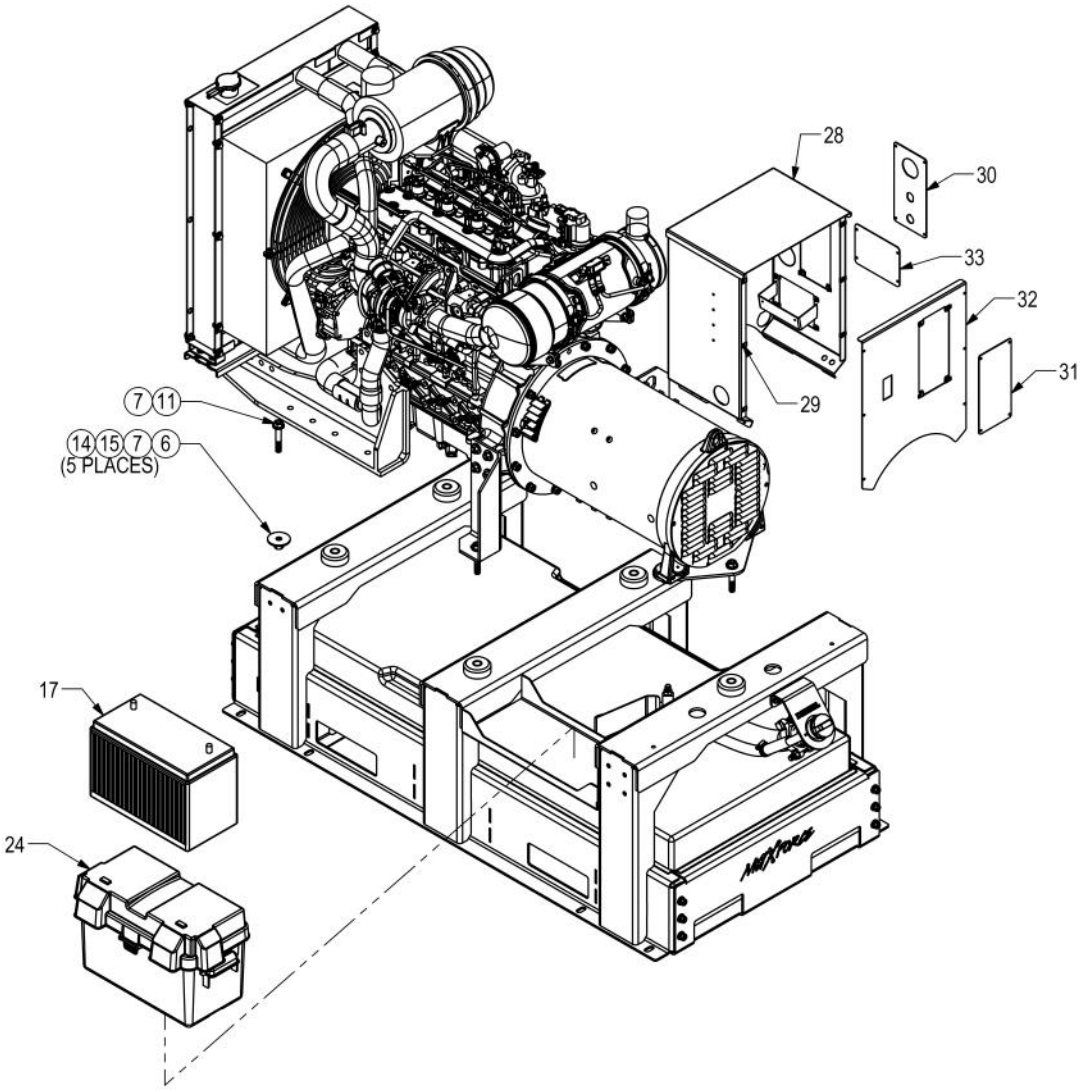

| Ref. | Part no. | Description | Qty |
|---|---|---|---|
| 3 | C90700-60 | D24 GENSET FRAME WELDMENT, 40 GAL TANK | 1 |
| 4 | C90700-03 | FRAME, END RAIL, MAXFORCE | 2 |
| 5 | V90700-04 | DIESEL FUEL TANK, 40 GAL, NATURAL COLOR | 1 |
| 8 | V90799-03 | FLAT WASHER | 48 |
| 9 | V90799-02 | SPLIT LOCK WASHER | 36 |
| 10 | V90799-01 | HEX BOLT | 36 |
| 13 | V90799-04 | HEX NUT | 12 |
| 19 | V90700-12 | FUEL FILLER NECK, DEISEL | 1 |
| 20 | V90726-03_1 | FILLER NECK FUEL LINE | 1 |
| 21 | W90700-62 | FILLER NECK MOUNT | 1 |
| 22 | V90726-02 | FUEL FILLER CAP, DIESEL, GREEN | 1 |
| 23 | V90726-04_1 | FILLER NECK VENT LINE | 1 |
| 25 | V90700-08 | RUBBER PUSH ON SEAL | 1 |
| 26 | 700150 | DOUBLE BOLT CLAMP | 2 |
| 27 | WDC#10 | #10 HOSE CLAMP | 2 |
| 40 | V90700-68 | VIBRATION ISOLATOR, SINGLE PT M | 5 |
| 41 | C90700-64 | VIBRATION ISOLATOR INNER WASHER | 5 |

## *Engine, Alternator*



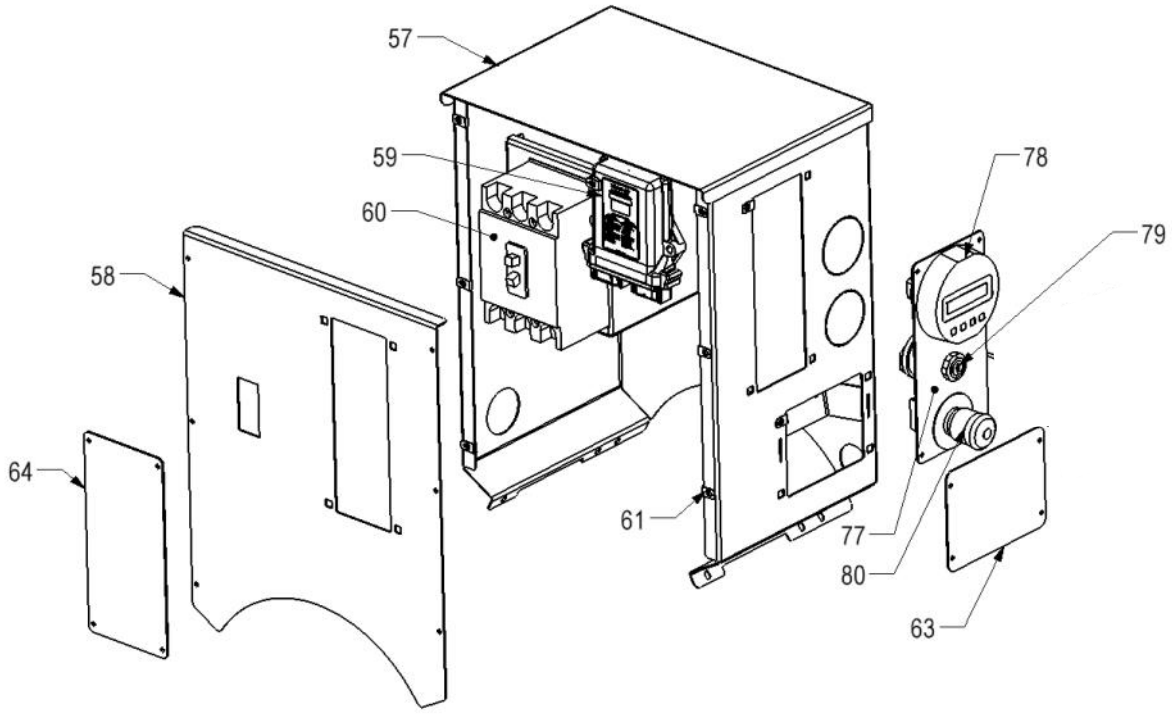

| Ref. | Part no. | Description | Qty |
|---|---|---|---|
| 1 | V90700-70 | ENGINE, Doosan D24 DIESEL, TIER IV F | 1 |
| 2 | V90700-05 | ALTERNATOR | 1 |
| 7 | V90799-12 | FLAT WASHER | 14 |
| 8 | V90799-17 | FLAT WASHER | 36 |
| 9 | V90799-18 | SPLIT LOCK WASHER | 34 |
| 12 | V90799-08 | FLANGE BOLT, SERR | 8 |
| 14 | V90799-11 | SPLIT LOCK WASHER | 7 |
| 15 | V90799-13 | HEX NUT | 7 |
| 16 | V90799-10 | HEX BOLT | 2 |
| 18 | C90700-11 | ALTERNATOR REAR MOUNT PLATE, SK | 1 |
| 42 | C90700-47 | REAR MOTOR MOUNT, LEFT | 1 |
| 43 | C90700-48 | REAR MOTOR MOUNT, RIGHT | 1 |
| 44 | V90799-27 | HEX BOLT | 20 |

## *Battery & Belt Guard*




| Ref. | Part no. | Description | Qty |
|---|---|---|---|
| 6 | V90700-03 | SNUBBING WASHER, VIBRATION ISOLATOR | 5 |
| 7 | V90799-12 | FLAT WASHER | 14 |
| 11 | V90799-09 | HEX BOLT | 5 |
| 14 | V90799-11 | SPLIT LOCK WASHER | 7 |
| 15 | V90799-13 | HEX NUT | 7 |
| 17 | V90700-10 | BATTERY | 1 |
| 24 | V90700-11 | BATTERY BOX | 1 |
| 28 | C90700-34 | GENERATOR DISCONNECT PANEL WELDMENT | 1 |
| 29 | V90700-36 | CLIP ON NUT | 18 |
| 30 | C90700-36 | CONTROLLER FACEPLATE | 1 |
| 31 | C90700-38 | CONTROLS FACEPLATE, BLANK | 1 |
| 32 | C90700-33 | GENERATOR DISCONNECT PANEL, FRONT PNL | 1 |
| 33 | C90700-37 | AVR COVER PLATE | 1 |

## *Control Box Assembly*




| Ref. | Part No. | Description | Qty |
|---|---|---|---|
| 57 | C90700-34 | GENERATOR DISCONNECT PANEL WELDMENT | 1 |
| 58 | C90700-33 | GENERATOR DISCONNECT PANEL, FRONT PNL | 1 |
| 59 | XCAN-AC | XCAN MODULE | 1 |
| 60 | CC3100 | CIRCUIT BREAKER | 1 |
| 61 | V90700-36 | CLIP ON NUT | 9 |
| 63 | C90700-37 | AVR COVER PLATE | 1 |
| 64 | C90700-38 | CONTROLS FACEPLATE, BLANK | 1 |
| 77 | C90700-36 | CONTROLLER FACEPLATE | 1 |
| 78 | | GENERATOR CONTROLLER | 1 |
| 79 | | KEY SWITCH | 1 |
| 80 | M22-PVT | EMERGENCY STOP | 1 |

# Notes

# Warranty

MaxForce warrants all equipment listed in this manual which is manufactured by MaxForce and bearing its name to be free from defects in material and workmanship on the date of sale by MaxForce or authorized distributor to the original purchaser for use. With the exception of any special extended or limited warranty published by MaxForce, MaxForce will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by MaxForce to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with MaxForce's written recommendations.

This warranty does not cover, and MaxForce shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, accident, tampering, or substitution of non-MaxForce component parts. Nor shall MaxForce be liable for malfunction, damage or wear caused by the incompatibility of equipment with structures, accessories, equipment or materials not supplied by MaxForce, or the improper design, manufacture, installation, operation or maintenance or structures, accessories, equipment or materials not supplied by MaxForce.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized MaxForce distributor for verification of the claimed defect. If the claimed defect is verified, MaxForce will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

MaxForce's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but no limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

MaxForce makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by MaxForce. These items sold, but not manufactured by MaxForce (such as electric motors, gas engines, switches, hose, hydraulic components, etc.) are subject to the warranty, if any, of their manufacturer. MaxForce will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will MaxForce be liable for indirect, incidental, special or consequential damages resulting from MaxForce supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of MaxForce, or otherwise.

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