OPERATOR'S SAFETY AND SERVICE MANUAL

VAPOR EXTRACTION UNIT

This manual covers the following serial numbers
and higher for each model listed:
85422D.....8540214



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⚠ WARNING ⚠

CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust and some of its constituents are known in the state of California to cause cancer, birth defects, and other reproductive harm.

SAFETY INFORMATION

Introduction

This Safety Alert Symbol is used to call attention to items or operations which may be dangerous to those operating or working with this equipment. The symbol can be found throughout this manual and on the unit. Please read these warnings and cautions, along with all decals, carefully before attempting to operate the unit. Make sure every individual who operates or works with this equipment is familiar with all safety precautions.

WARNING

GENERAL WARNING. Indicates information important to the proper operation of the equipment. Failure to observe may result in damage to the equipment and/or severe bodily injury or death.

CAUTION

GENERAL CAUTION. Indicates information important to the proper operation of the equipment. Failure to observe may result in damage to the equipment.

Safety Precautions



LETHAL EXHAUST GAS: An internal combustion engine discharges carbon monoxide, a poisonous, odorless, invisible gas. Death or serious illness may result if inhaled. Operate only in a properly ventilated area. NEVER OPERATE IN A CONFINED AREA!



DANGEROUS FUELS: Use extreme caution when storing, handling and using fuels as they are highly volatile and explosive in vapor state. Do not add fuel while engine is running. Stop and cool the engine before adding fuel. DO NOT SMOKE!



SAFETY GUARDS: It is the owner's responsibility to ensure that all guards and shields are in place and in working order.



IGNITION SYSTEMS: Breakerless, magneto, and battery ignition systems can cause severe electrical shocks. Avoid contacting these units or their wiring.



SAFE DRESS: Do not wear loose clothing, rings, wristwatches, etc. near machinery.



NOISE PROTECTION: Wear OSHA specified hearing protection devices.
EYE PROTECTION: Wear OSHA specified eye shields, safety glasses, and sweat bands.



FOOT PROTECTION: Wear OSHA specified steel-tipped safety shoes.
HEAD PROTECTION: Wear OSHA specified safety helmets.



OPERATOR: Keep children and bystanders off and away from the equipment.

REFERENCES: For details on safety rules and regulations in the United States, contact your local Occupational Safety and Health Administration (OSHA) office. Equipment operated in other countries must be operated and serviced in accordance and compliance with any and all safety requirements of that country. The publication of these safety precautions is done for your information.Sencore Construction Products (Sencore) does not by the publication of these precautions, imply or in any way represent that these are the sum of all dangers present near Sencore equipment. If you are operating Sencore equipment, it is your responsibility to insure that such operation is in full accordance with all applicable safety requirements and codes. All requirements of the United States Federal Occupational Safety and Health Administration Act must be met when operated in areas that are under the jurisdiction of that United States Department.

Safety Decals

Carefully read and follow all safety decals. Keep them in good condition. If decals become damaged, replace as required. If repainting the unit, replace all decals. Decals are available from authorized Sencore distributors. Order the decal set listed on the following page.

DIESEL FUEL
01623

01623
(ON FUEL TANK)

CAUTION
DO NOT expose sensor to shock or vibration.
Allow sensor to finish warm-up cycle prior to use.
Calibrate sensor prior to first use, and as directed by manual
19257

19257
(ON SENSOR STAND)

WARNING
Operating, servicing and maintaining this equipment can expose you to chemicals, including engine exhaust, phthalates and lead, which are known to the state of California to cause cancer and birth defects or other reproductive harm. Avoid breathing engine exhaust. Do not operate equipment in confined areas. For more information go to **www.P65Warnings.ca.gov**
21820

21820

VAPOR EXTRACTION UNIT

20241

MBW.COM
VEU 21750

21750

CAUTION
Read the Operating Instructions before operating this piece of equipment.
Keep unauthorized and untrained people away from this equipment.
ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.
Wear approved hearing protection, foot protection, eye protection and head protection.
SHUT OFF the motor before servicing or cleaning.
DO NOT RUN in an enclosed area. The engine produces carbon monoxide, a **POISONOUS GAS**.
Failure to comply could result in serious bodily injury.
13483

13483

MBW

20239

OPERATING INSTRUCTIONS

1. **Ensure gas concentration in work area is safe for open ignition sources. DO NOT use machine in areas that are unsafe.**
2. Ensure machine is grounded and hoses have continuity before each use.
3. Open bypass valve fully, close all vacuum supply valves on canister, open valves on probes.
4. Plug sensor lead into socket below engine control box.
5. The "Wait to start" light will light during the sensor's 4 minute warm-up routine. **Engine will not run until this period is complete.**
6. Start engine. If cold, wait for glowplugs.
7. Warm up engine at idle.
8. Run engine speed up to approximately 30%.
9. While watching LEL percent on sensor, slowly begin opening vacuum supply valve.

NOTE: Gas stream through the VEU must remain below 25% LEL. If Low alarm is triggered, close vacuum supply valve, open bypass valve, and start again. If High alarm is reached, engine will shut down. Press "Reset" button, and start at step 5.

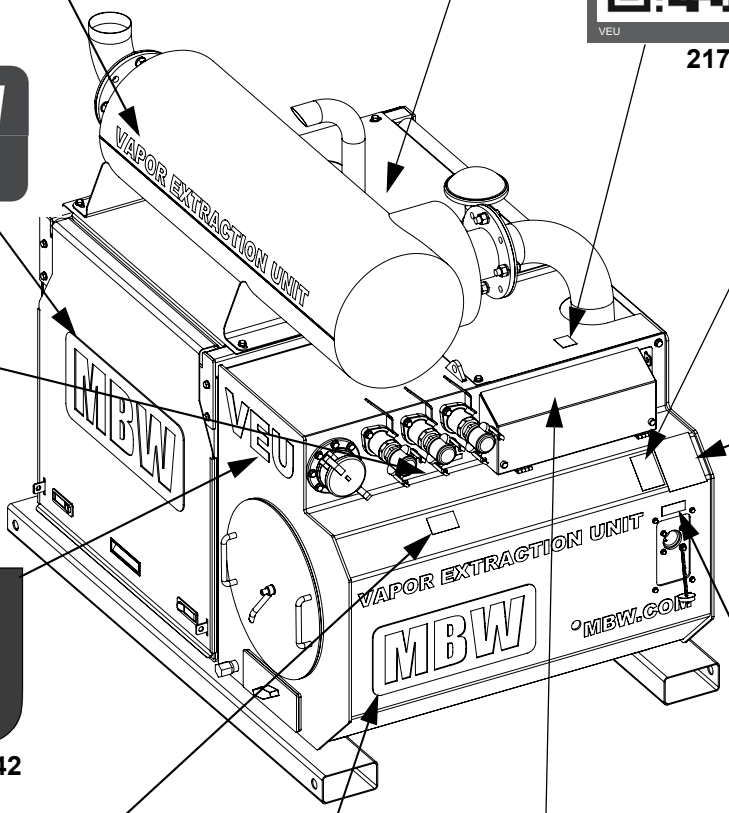
10. After vacuum supply valve is open fully, run engine up to full throttle, and begin to close bypass valve. See note above.
11. After bypass valve is closed fully, run engine as needed to evacuate ground of gas.
12. If desired, turning off individual probes can help locate leak.
13. Before shutting down engine, allow it to Idle 1-2 minutes to cool.

19259

19259

U.S. PATENT 7,210,336
19380

19380



VEU

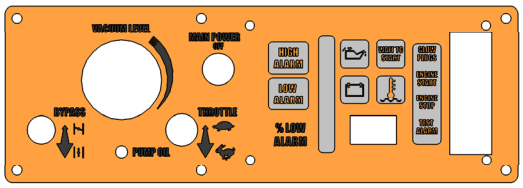
20242

SENSOR STAND PLUG
Engine will not run unless sensor is plugged in
19240

19240

WARNING
High suction can cause serious injury.
Keep all body parts away from vacuum ports.
19242

19242



20123

VAPOR EXTRACTION UNIT

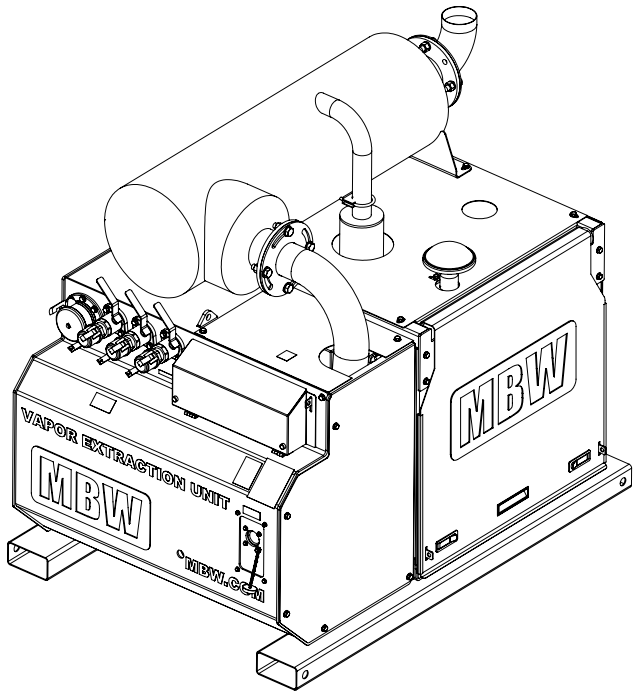
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20240

Safety Decals

SPECIFICATIONS



Operating Weight	1565 LBS (710 KG)
Height	47.5” (113 cm)
Width	43” (109 cm)
Length	66.5” (169cm)
Engine	Isuzu 3CH1
Recommended Engine RPM	2500 rpm
Fuel Consumption	1.0 Gal/hr
Fuel Capacity	8 gallons (30.3L)
Blower	Eurus 862 cfm
Recommended Vacuum	6”Hg
Operating Noise Level[1]	90-100 db
Gas Monitor	Industrial Scientific Itrans w/ LEL
Alarm Threshold	35% LEL
Engine Stop Threshold	50% LEL
Max Flow Rate Per Probe	19 cfm

Specifications subject to change without notice

1. Noise levels are taken at the operating position and are based on operating conditions. Background noise will increase noise levels.

OPERATION

Introduction

This parts manual contains only standard parts. Variations of these parts as well as other special parts are not included. Contact your local MBW distributor for assistance in identifying parts not included in this manual.

Before Starting & Operating

- Operating VEU creates a possible source of ignition for flammable gas plume. BE CERTAIN ATMOSPHERE IS SAFE BEFORE OPERATING THIS MACHINE!
- Ensure machine is grounded and hoses have continuity before each use.
- REMEMBER! It is the owner's responsibility to communicate information on the safe use and proper operation of this unit to the operators.
- Review ALL of the Safety Precautions listed on page 1 of this manual.
- Familiarize yourself with the operation of the machine and confirm that all controls function properly.
- Know how to STOP the machine in case of an emergency.
- Make sure hands, feet, and clothing are at a safe distance from any moving parts or high suction areas.
- ENGINE OIL LEVEL - Check the oil level in the engine. For more information see "Lubrication" under the respective engine's "Owners Manual" or the Maintenance section of this manual.
- ENGINE AIR CLEANER - Check to ensure element is in good condition and properly installed.
- BLOWER AIR CLEANER - Check to ensure element is in good condition and properly installed.
- BLOWER OIL LEVEL - Locate the site glass hole in the front panel to check oil level in the blower. See respective blower "Owners Manual" for more information.
- FUEL SUPPLY - The engines on MBW equipment require an automotive grade of clean, fresh, diesel fuel.
- FUEL FILTER - If clogged or damaged, replace.
- GAS SENSOR - Be familiar with operation of gas sensor. Refer to sensor manual. Be certain that the sensor has been calibrated and is in working order. MBW recommends the sensor be calibrated at least every 3 months.

Assembling Probes

1. Place probes into ground
2. Connect probes to VEU with hose assemblies.

Note: **The MBW VEU probes can be connected to the VEU in many ways. Each utility should develop their own best practice to make the connections. To avoid a significant pressure drop, MBW recommends not connecting more then 6 (six) probes to a single 1-1/2" branch hose. If more probes are desired, they should be connected to a new branch line coming off the VEU.**

3. Open all valves on VEU probes.
4. Cap all open hose ends with CAM-Loc plugs/caps.
5. Close unused manifold valves on VEU.
6. Fully open Air-Bypass valve before starting engine.

Starting Engine

For detailed instructions refer to the engine "Owner's Manual".

⚠ WARNING ⚠

Ensure gas concentration in work area is safe for open ignition sources. DO NOT use machine in areas that are unsafe.

⚠ WARNING ⚠

Ensure sampling line and cup are in place at bottom of sensor. DO NOT use machine if the sampling line is not connected.

7. Plug sensor/vacuum combo plug into socket on canister housing.

Note: Engine will NOT run without sensor plugged in.

8. When power is supplied to the sensor stand assembly the sensor will start a warm up cycle. **This cycle will take approximately 4 minutes and engine will NOT RUN until the "Wait to Start" light turns off.**
9. Open bypass valve fully, close all vacuum supply valves on canister, open valves on probes.
10. Turn toggle switch to "ON".
11. Press glow plug button if engine is cold. Glow plugs will cycle each time button is pressed.
12. Press engine start button to engage starter.
13. Allow engine to warm up for one or two minutes.

Operating

1. Ensure proper operation of gas sensor.
2. Run engine speed up to approximately 30%.
3. While watching LEL percent on sensor or bar graph on control panel, slowly begin opening vacuum supply valve.

⚠ WARNING ⚠

Gas stream through the VEU must remain below 35% LEL. If Low alarm is triggered, close vacuum supply valve, open bypass valve, and start at step 3. If High alarm is reached, engine will shut down. Engine will not start until LEL is below 50%.

4. After vacuum supply valve is open fully, run engine up to full throttle, and begin to slowly close the bypass valve. See note above. Operating point will be determined by these factors:
   - •Configuration of probes
   - •Gas concentration in ground
   - •Recommended engine speed
   - •Recommended vacuum level
5. After bypass valve is closed fully, run engine as needed to evacuate ground of gas.
6. If desired, turning off individual probes can help locate leak.

Stopping Engine

1. Fully open air-bypass valve to unload engine.
2. Move throttle to idle position.
3. Let engine idle for one or two minutes.
4. Press engine stop button, or turn off toggle switch.

⚠ WARNING ⚠

Always stop the engine before:

Adding fuel.

Leaving the equipment unattended for any amount of time.

Before making any repairs or adjustments to the machine.

MAINTENANCE

⚠ WARNING ⚠

Always exercise the stopping procedure before servicing or lubricating the unit.

After servicing the unit, replace and fasten all guards, shields, and covers to their original positions before resuming operation.

⚠ CAUTION ⚠

Always verify fluid levels and check for leaks after changing fluids.

Do not drain oil onto ground, into open streams, or down sewage drains.

Maintenance Schedule

SYSTEM	MAINTENANCE	DAILY	EVERY 25 HOURS	EVERY 300 HOURS	YEARLY
Vac air filter	Check and clean	X			
Engine	Refer to engine operator/owner manual	X			
Fuel	drain tank				X
Hardware	Check and tighten as needed[1]		X		X
In Line Fuel Filter	Replace			X	X
Blower	Refer to Blower operators/owners manual	X			
Gas Sensor	Calibrate[2] (Refer to Gas Sensor manual)				4x
	Test	X			

1. Check all hardware after the first 5 hours of use, then follow the maintenance schedule.
2. Calibrate sensor before using VEU. Sensor is NOT calibrated from the factory.

Engine Maintenance

Refer to the engine owner's manual for maintenance intervals and procedures.

- Check the engine air cleaner element at least once daily.
- Check the engine oil level by removing the dipstick (the engine must be level). The oil level should be between the marks on the dipstick. See the "Check Engine Oil" section of the engine "Owner's Manual" for information.
- See the "Change Engine Oil" section of the engine "Owner's Manual" for information on the oil change intervals.
- Disconnect battery for long term storage.

Draining Fuel Tank

Refer to Main Assembly, page 12.

1. Remove brackets holding tank.
2. Loosen hose clamps and remove hoses.
3. Drain until all water and contaminates are cleared.
4. Properly dispose of drained fuel.

Engine Speed

Engine speed is factory set according to the speed listed in the Recommended Engine RPM, page 3 of this manual. Refer to the engine owners manual for procedure on setting operating speed if necessary.

Blower Maintenance

The blower is a ZZ5LA built by Eurus Blower. It contains both a grease and an oil bath lubrication system. Oil sight hole located on front cannister panel. Check level daily. Refer to blower manual for service instructions. More information can be found at www.eurusblower.com.

Cleaning Blower Air filter

Refer to Canister and Blower Assembly, page 14.

1. Remove outer knob (# 16) and outer door (#5).
2. Remove inner knob (# 15) and inner door (# 21).
3. Slide filter out of housing.

4. Remove prefilter and wash with clean warm water.
5. Wash filter with low pressure water, Such as from a garden hose. DO NOT use a high pressure sprayer. If any holes or thin spots are apparent in filter, It must be replaced.
6. Let filters air dry.
7. Put prefilter around filter, and slide into canister housing. The rear of the filter is supported by a tab welded to the back wall of canister.
8. Install front cover making sure filter is straight and seated against rear wall and cover. Tighten knob snugly against cover.
9. Install front cover and knob.

Sensor Maintenance

Sensor must be calibrated before first use. Sensor is NOT calibrated at the factory.

Sensor programming mode is password protected. To enter programming mode, remove cover of sensor and enter “Mode, Mode, Up, Down, Up, Enter.” For non-intrusive operation, see www.teledynegfd.com for sensor manual. See the sensor manual for further instructions.

The sensor is a sensitive piece of electronic equipment and should be treated as such. DO NOT expose the sensor to vibration. DO NOT expose to temperatures below -4° F or above 122° F.

Sensor Relay/Alarm Testing

1. Plug Electronics stand into VEU.
2. Start engine after sensor warm-up is complete. Refer to Starting Engine, page 5.
3. Press test button on control panel. Engine should shut down within seconds. Alarm and all lights should activate. If it does not, Do Not use the VEU until it is fixed.

Oiling the blower for long term storage

If the VEU will be stored more than one week without use, it is required that the user oil the blower to prevent surface corrosion or the internal vanes.

1. Run the machine at idle, with the bypass valve in the open position.
2. Remove the small rubber cap located under the vacuum gauge.
3. Spray a light lubricating oil, such as WD-40 into the hole for several seconds.

The spray must not contain silicone. Silicone may damage the sensor.

4. Replace the rubber cap and stop the machine.

Assembly and disassembly should be performed by a service technician who has been factory trained on MBW equipment. The unit should be clean and free of debris. Pressure washing before disassembly is recommended.

- Prior to assembly, wash all parts in a suitable cleaner or solvent.
- Check moving parts for wear and failure. Refer to the Replacement section in this manual for tolerance and replacement cycles.
- All shafts and housings should be oiled prior to pressing bearings. Also, ensure that the bearings are pressed square and are seated properly.
- All bearings should be replaced when rebuilding any exciter or gearbox.
- All gaskets and seals should be replaced after any disassembly.

Torque Chart

SIZE	GRADE 2	GRADE 5	GRADE 8
1/4-20	49 in•lbs	76 in•lbs	9 ft•lbs
1/4-28	56 in•lbs	87 in•lbs	10 ft•lbs
5/16-18	8 ft•lbs	13 ft•lbs	18 ft•lbs
5/16-24	9 ft•lbs	14 ft•lbs	20 ft•lbs
3/8-16	15 ft•lbs	23 ft•lbs	33 ft•lbs
3/8-24	17 ft•lbs	26 ft•lbs	37 ft•lbs
7/16-14	24 ft•lbs	37 ft•lbs	52 ft•lbs
7/16-20	27 ft•lbs	41 ft•lbs	58 ft•lbs
1/2-13	37 ft•lbs	57 ft•lbs	80 ft•lbs
1/2-20	41 ft•lbs	64 ft•lbs	90 ft•lbs
9/16-12	53 ft•lbs	82 ft•lbs	115 ft•lbs
5/8-11	73 ft•lbs	112 ft•lbs	159 ft•lbs
5/8-18	83 ft•lbs	112 ft•lbs	180 ft•lbs
3/4-16	144 ft•lbs	200 ft•lbs	315 ft•lbs
1-8	188 ft•lbs	483 ft•lbs	682 ft•lbs
1-14	210 ft•lbs	541 ft•lbs	764 ft•lbs
1-1/2-6	652 ft•lbs	1462 ft•lbs	2371 ft•lbs
M 6	3 ft•lbs	4 ft•lbs	7 ft•lbs
M 8	6 ft•lbs	10 ft•lbs	18 ft•lbs
M 10	10 ft•lbs	20 ft•lbs	30 ft•lbs
CONVERSIONS			
in•lbs x 0.083 = ft•lbs			
ft•lbs x 12 = in•lbs			

SIZE	GRADE 2	GRADE 5	GRADE 8
ft•lbs x 0.1383 = kg•m			
ft•lbs x 1.3558 = N•m			

Service Tools

PART NO.	DESCRIPTION
19279	KIT, SENSOR CALIBRATION
20350	SERVICE KIT, VEU, ISUZU
19263	BLOWER OIL, QUART

Replacing Shaft Coupler

Refer to Main Assembly, page 12.

1. Remove the four nuts and bolts securing Silencer inlet adapter (# 14) to the silencer(# 17)
2. Remove the Blower End Side panel (# 6)
3. Remove the air cleaner outer door.
4. Loosen the six mounting bolts (# 44) which secure the canister weldment to the frame. Remove all but the front most bolt on the air cleaner side.
5. Carefully pivot the blower end of the weldment away from the engine, making sure not to stress any wiring or cables. It will only be necessary to move the end about 3” to remove the coupler (# 3).
6. Replace the coupler and slide the canister back into place, aligning the splines of the drivers and coupler.
7. Ensure that the shoulders of the drivers are flush with the ends of the coupler, and that the shafts are still aligned.
8. Replace the canister mounting bolts (# 44), sealing the three bolts in the air filter end with silicone sealant.
9. Reinstall the four bolts securing the silencer inlet adapter to the silencer and the blower end side panel.

Parts Replacement Cycles and Tolerances

Engine Components	Refer to your engine manufacturer's Owner's Manual.
Hardware	Replace any worn or damaged hardware as needed. Replacement hardware should be grade 5 and zinc plated unless otherwise specified.
Safety Decals	Replace if they become damaged or illegible.
Seals & Gaskets	Replace if a leak is detected and at every overhaul or teardown.

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REPLACEMENT PARTS

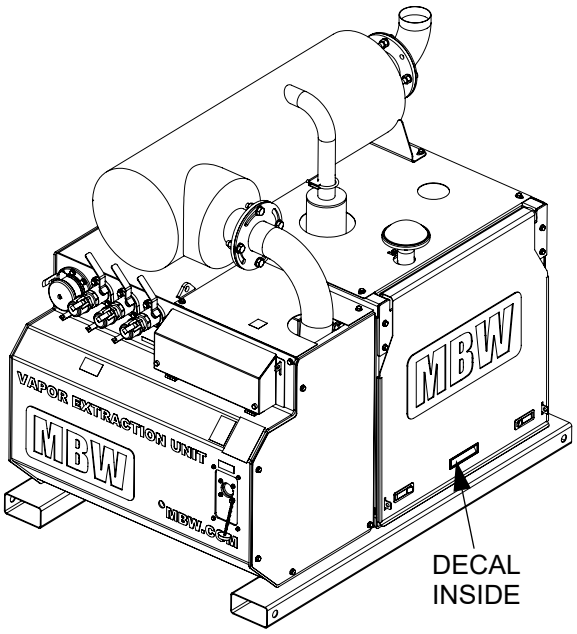
The warranty is stated in this book on page 30. Failure to return the Warranty Registration Card renders the warranty null and void.

MBW has established a network of reputable distributors/ dealers with trained mechanics and full facilities for maintenance and rebuilding, and to carry an adequate parts stock in all areas of the country. Their sales engineers are available for professional consultation. If you cannot locate an MBW distributor in your area, contact MBW or one of our Sales Branches listed below.

When ordering replacement parts, be sure to have the following information available:

- Model and Serial Number of machine when ordering MBW parts
- Model and Serial Number of engine when ordering engine parts
- Part Number, Description, and Quantity
- Company Name, Address, Zip Code, and Purchase Order Number
- Preferred method of shipping

REMEMBER - You own the best! If repairs are needed, use only MBW parts purchased from authorized MBW distributors.



The unit's serial number can be found in the following location:

- Serial decal placed on the engine mounting rail on the frame.

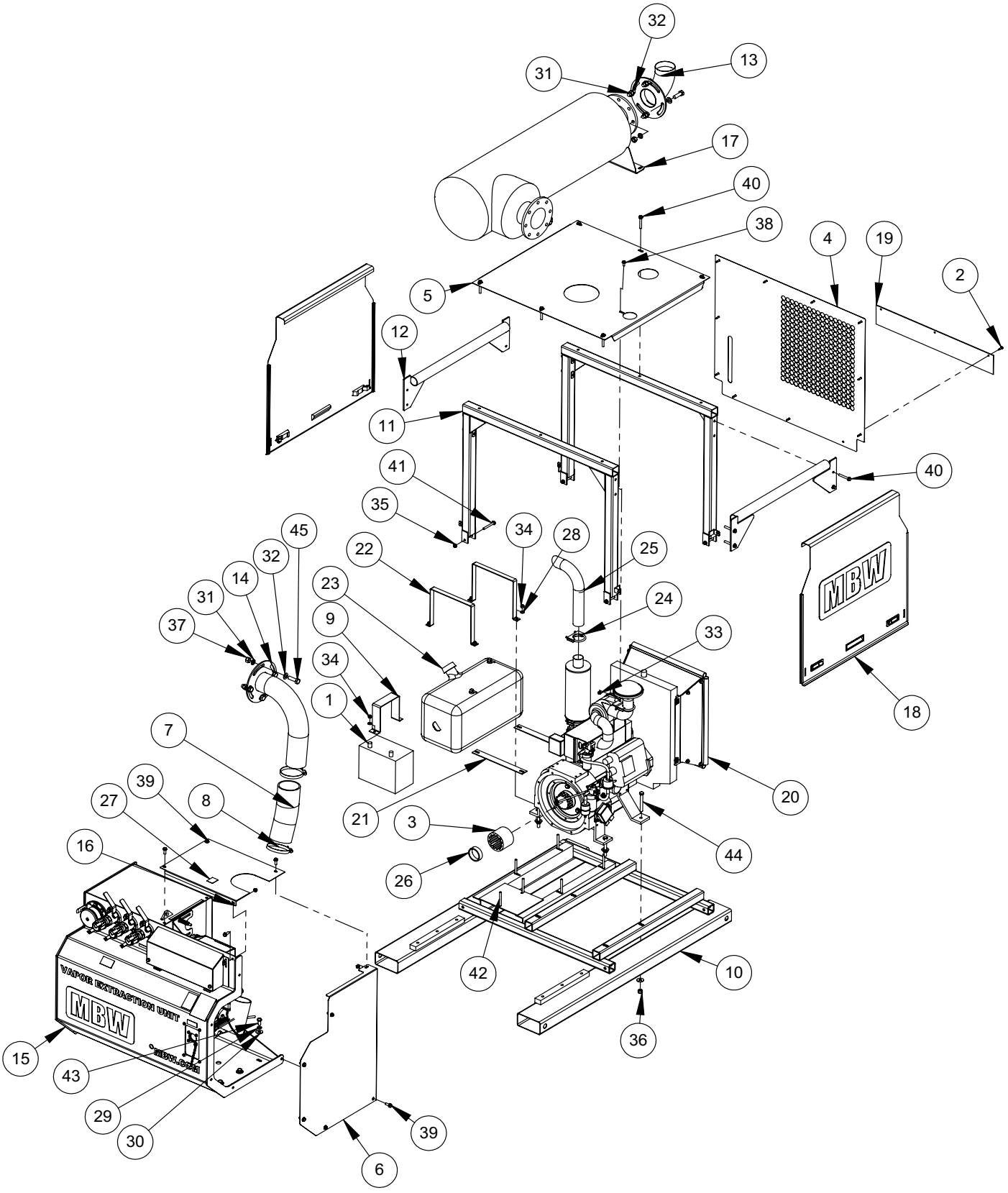
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Contact Information

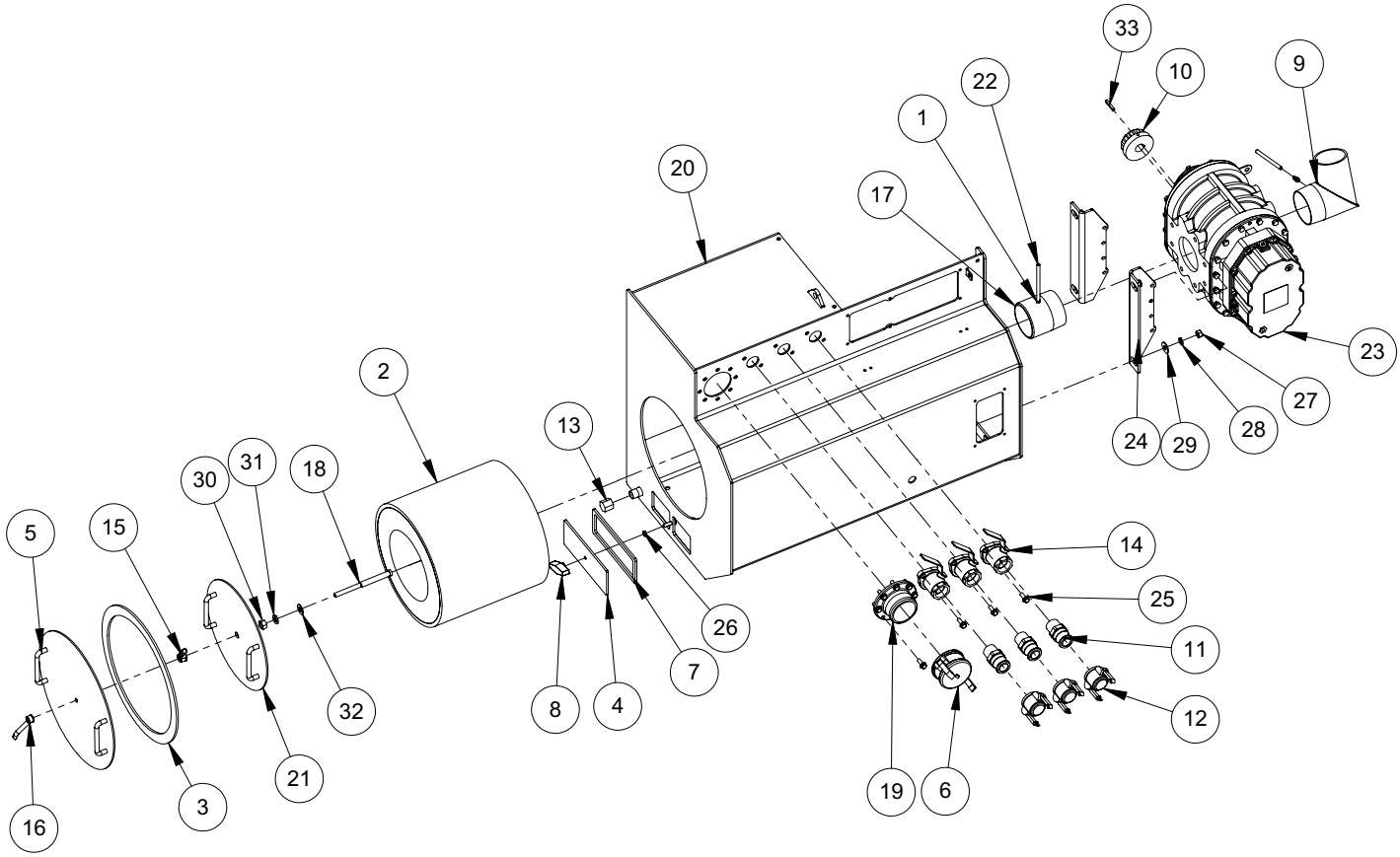
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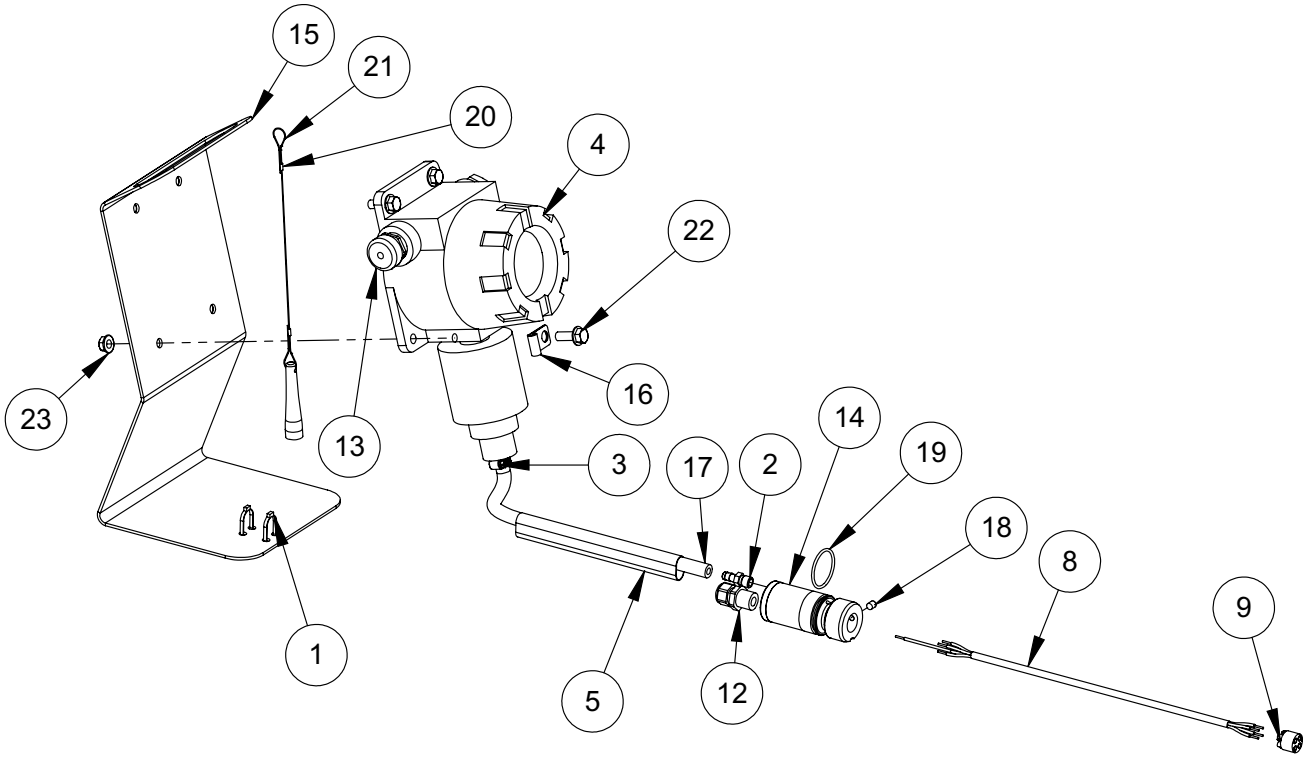
Main Assembly

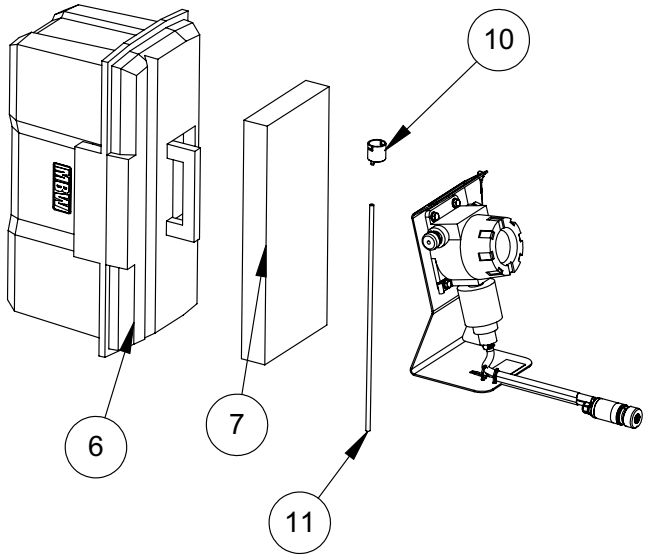
ITEM	PART NO.	DESCRIPTION	QTY
1.	09247	BATTERY	1
2.	11162	SCREW, 1/4 X 1 TEKS	11
3.	18923	COUPLER, GEAR GRIP, TUBE	1
4.	20050	PANEL, RADIATOR	1
5.	20051	PANEL, ROOF	1
6.	23278	PANEL, BLOWER END	1
7.	20053	HOSE, 4.0 X 12	1
8.	20054	HOSE CLAMP, 4”	2
9.	20057	STRAP, BATTERY	1
10.	20061	FRAME, VEU	1
11.	20068	UPPER FRAME, VEU	2
12.	20074	CROSS MEMBER, UPPER VEU FRAME	2
13.	20077	ELBOW, EXHAUST	1
14.	20080	INLET ADAPTER, SILENCER	1
15.	20082	ASM, CANISTER AND BLOWER (See Canister and Blower Assembly, page 14)	1
16.	20091	PANEL, BLOWER ROOF	1
17.	20106	SILENCER ASM	1
18.	20109	DOOR ASM, VEU	2
19.	20443	SHROUD, FRONT, VEU	1
20.	20961	ENGINE ASM, ISUZU 3CH1	1
21.	20989	SUPPORT, FUEL TANK, 8 GALLON	2
22.	20990	STRAP, FUEL TANK	2
23.	20994	FUEL TANK, 8 GALLON	1
24.	21070	EXHAUST CLAMP, 2 3/8	1
25.	21321	EXHUAST OUTLET, VEU	1
26.	21676	TUBE, INSERT	1
27.	21750	DECAL, QR, VEU	1
28.	F06PW	WASHER, 13/32 X 13/16 X 1/16 ZP	6
29.	F08LW	LOCKWASHER, 1/2 ZP	6
30.	F08SW	WASHER, 9/16 X 1-3/8 X 12GA ZP	10
31.	F10LW	LOCKWASHER, 5/8 ZP	8
32.	F10PW	WASHER, 5/8 X 1-1/4 X 12GA ZP	8
33.	F0518FN	NUT, FLANGE WHIZ-LOCK 5/16-18 ZP	1
34.	F0616ELN	LOCKNUT, 3/8-16 NYLOC ZP	6
35.	F0616FN	FLANGE WHIZ-LOCK NUT, 3/8-16	5
36.	F0813ELN	LOCKNUT, 1/2-13 NYLOC ZP	4
37.	F1011HN	NUT, HEX 5/8-11 ZP	8
38.	F051806FWS	FWLS, 5/16-18 X 3/4 ZP	1
39.	F061608FWS	FWLS, 3/8-16 X 1 ZP	9
40.	F061620FWS	FWLS, 3/8-16 X 2-1/2 ZP	14
41.	F061624FWS	FWLS, 3/8-16 X 3 ZP	4
42.	F061628CB	CAR BOLT, 3/8-16 X 3-1/2	6
43.	F081308HCS	HHCS, 1/2-13 X 1 GR5 ZP	6
44.	F081332HCS	HHCS, 1/2-13 X 4 GR5 ZP	4
45.	F101116HCS	HHCS, 5/8-11 X 2 GR5 ZP	8
	22268	ENGINE MOUNT SHIMS .045”	
	22269	ENGINE MOUNT SHIMS, .250”	



Canister and Blower Assembly

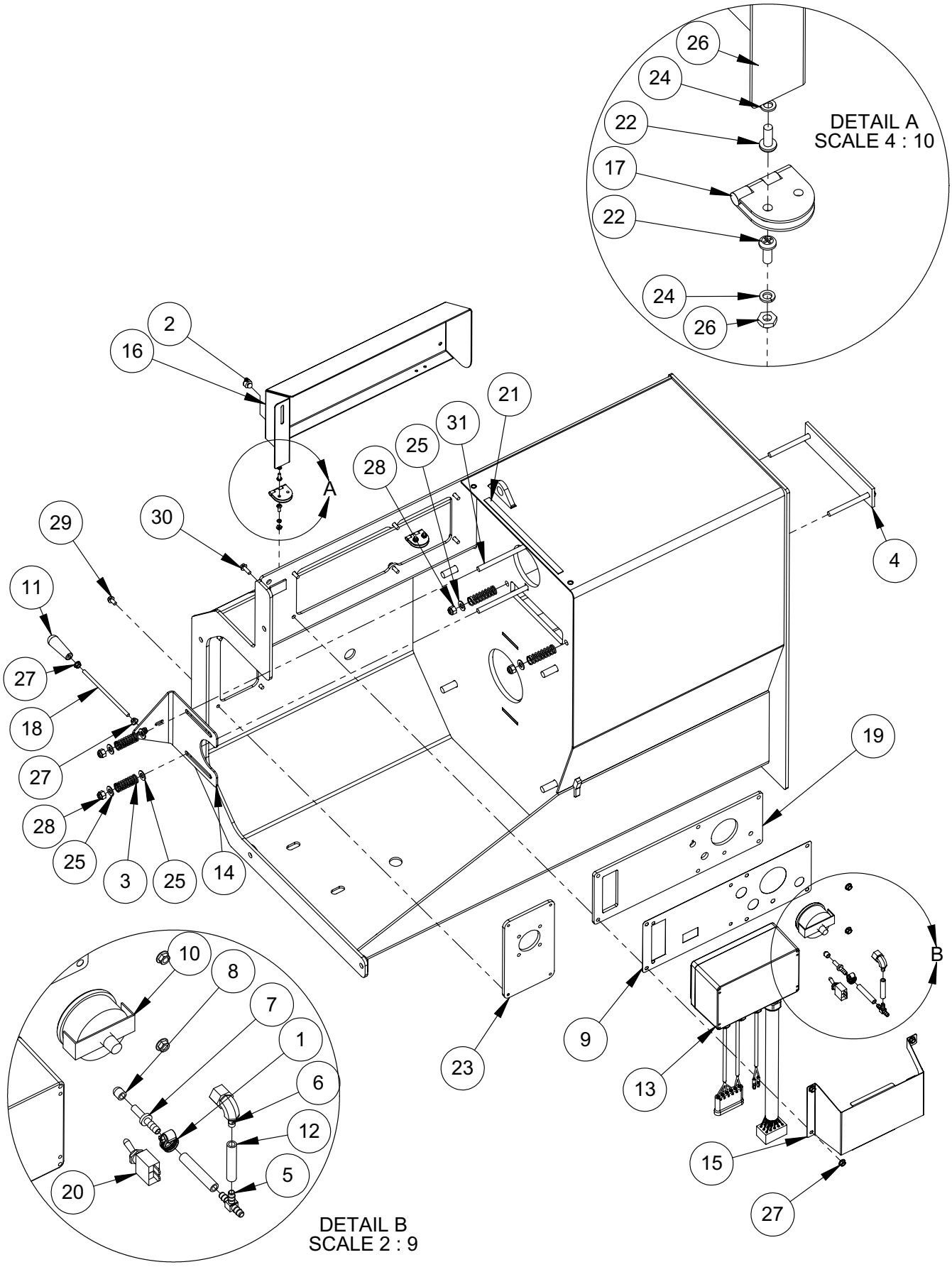
ITEM	PART NO.	DESCRIPTION	QTY
1.	05803	MALE PIPE ADAPTER	2
2.	18920	FILTER, VEU	1
3.	18960	GASKET, DOOR	1
4.	18966	COVER, SUMP	1
5.	18972	DOOR, WELDMENT	1
6.	18984	COVER, 3” CAMLOCK	1
7.	18988	GASKET, BILGE	1
8.	18989	KNOB, THUMB	1
9.	18996	ELBOW, SILENCER	1
10.	19047	COUPLER, GEARGRIP, 1-1/8	1
11.	19185	COUPLING, 1-1/4 NPT, CAM LOCK	3
12.	19256	DUST CAP, 1-1/4 FEMALE	3
13.	19455	PIPE CAP, HEX	1
14.	20083	VALVE, FLANGE MOUNT	3
15.	20084	HANDLE, 5/8-11	1
16.	20085	HANDLE, 1/2-13	1
17.	20087	ADAPTER, BLOWER	1
18.	20088	DOOR ROD, CANISTER	1
19.	20092	FITTING, 3” CAMLOCK	1
20.	20095	CANISTER, WELDMENT	1
21.	20102	FILTER CAP, WELDMENT	1
22.	20245	BULK PVC HOSE 1/4”	2
23.	23282	BLOWER	1
24.	23283	MOUNTING FOOT, BLOWER, PAINTED	2
25.	F061608FWS	FWS, 3/8-16 x 1 ZP	14
26.	F0616HJN	NUT, HEX JAM 3/8-16 ZP	1
27.	F0813HN	NUT, HEX 1/2-13 ZP	4
28.	F08LW	LOCKWASHER, 1/2 ZP	4
29.	F08SW	WASHER, 9/16 x 1-3/8 x 12GA ZP	4
30.	F1011HN	NUT, HEX 5/8-11 ZP	1
31.	F10LW	LOCKWASHER, 5/8 ZP	1
32.	F10PW	WASHER, 5/8 x 1-1/4 x 12 ga ZP	1
33.	00808	KEY, 1/4 SQ X 1-3/4	1
	19263	BLOWER OIL, 1 QT	
	19821	PREFILTER, FOAM	





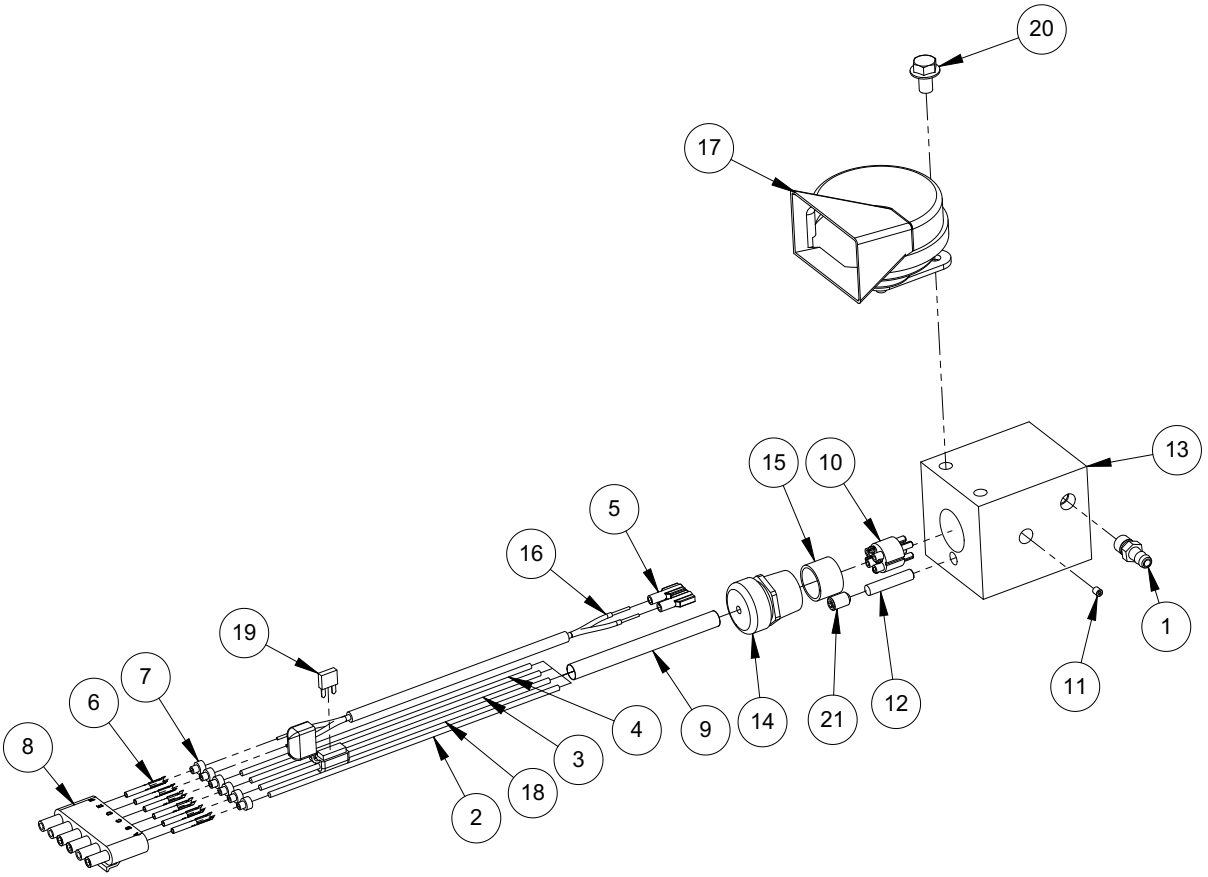
Sensor Stand Assembly

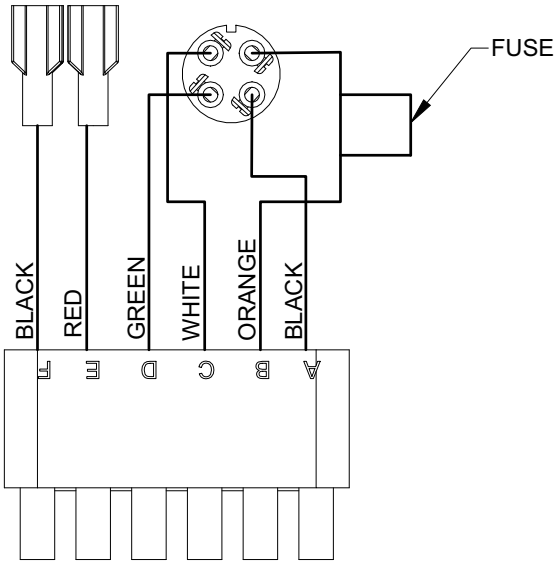
ITEM	PART NO.	DESCRIPTION	QTY
1.	01291	TIE, CABLE	2
2.	05803	MALE PIPE ADAPTER	1
3.	08442	CLAMP, WORM DRIVE, SS	2
4.	18849	SENSOR, GAS	1
5.	19258	WIRE WRAP, BRAIDED, SPLIT	10”
6.	19267	BOX, ELECTRONICS STAND	1
7.	19275	FOAM 2 X 10 X 19	1
8.	19276	CORD BULK, 18 GA, 4 WIRE	1
9.	19475	PLUG 4 CONNECTOR FEMALE	1
10.	19532	SENSOR CUP, REPLACEMENT	1
11.	20093	HOSE, 1/4 X 18	1
12.	20149	WIRE STRAIN RELIEF, SMALL	1
13.	20220	CORD GRIP, 3/4 NPT	1
14.	20222	PLUG, VEU, MACHINED	1
15.	20224	SENSOR STAND, PAINTED	1
16.	20244	WIRE CLAMP, 1/4”	1
17.	20245	BULK PVC HOSE, 1/4”	10”
18.	20593	SET SCREW, 1/4-20 X 3/8, POINTED	1
19.	20867	O-RING, 1.50 ID X .094 (for serial no 8540033 and above)	1
	20223	O-RING, 1.38 ID X .06 (for serial no 8540032 and below)	1
20.	22107	COMPRESSION SLEEVE	2
21.	22108	WIRE ROPE, 1/32 DIAMETER	15”
22.	F051806FWS	FWLS, 5/16-18 X 3/4 ZP	4
23.	F0518FN	NUT, FLANGE WHIZ-LOCK 5/16-18 ZP	4
	20218	SENSOR STAND ASM (INCLUDES ITEMS 1-23)	
	19946	SENSOR WAND, MAGNETIC, USE 23062	
	20275	SENSOR MODULE, ITRANS	
	21727	SENSOR, SERVICE ASM (INCLUDES ITEMS 4, 8, 9, 12, 13)	
	23062	KIT, MAGNETIC WAND ASM (INCLUDES ITEMS 20, 21, 19946)	



Control Assembly

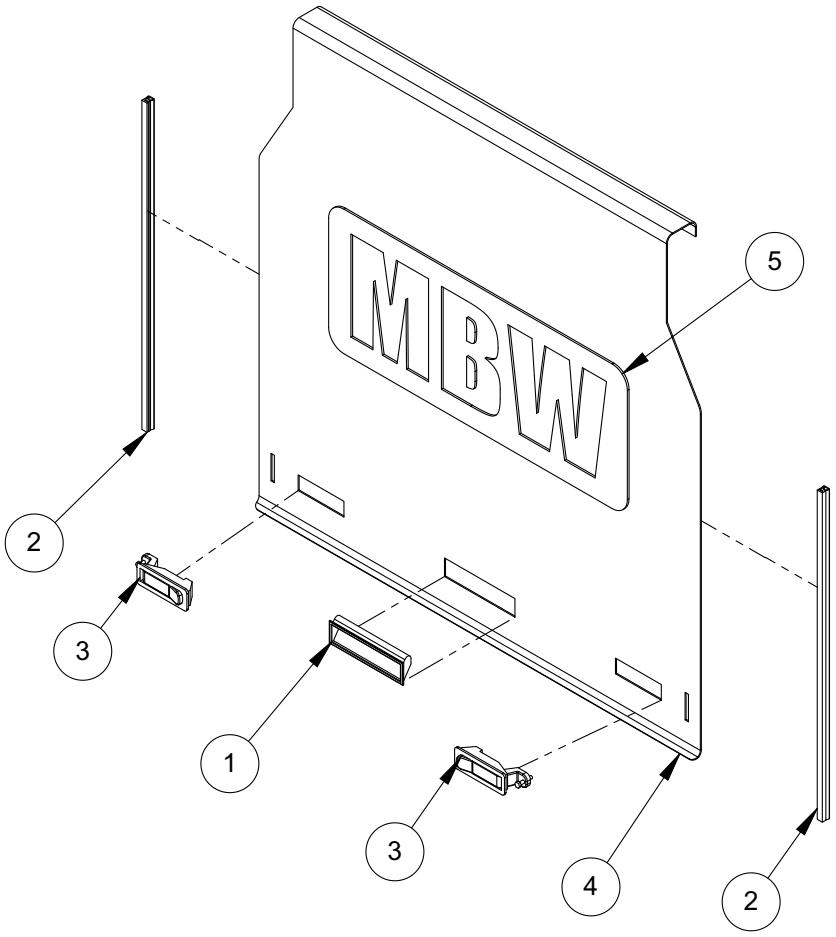
ITEM	PART NO.	DESCRIPTION	QTY
1.	08442	CLAMP, WORM DRIVE, SS	1
2.	11161	BUMPER, RUBBER	2
3.	19190	SPRING, COMPRESSION, RELIEF	4
4.	20103	ASM, RELIEF PLATE	1
5.	20116	T FITTING .25 HOSE	1
6.	20117	ADAPTER, 1/4 NPT X 1/4 HOSE, 90	1
7.	20119	PRESSURE PORT	1
8.	20121	PUSH ON CAP	1
9.	20123	INSERT, CONTROL PANEL	1
10.	20155	VACUUM GAGE, PANEL MOUNT	1
11.	20207	HANDLE, BYPASS	1
12.	20245	BULK PVC HOSE, 1/4”	4”
13.	20402	ELECTRICAL ASM, VEU	1
14.	20969	BYPASS VALVE, PAINTED	1
15.	20970	SUPPORT, CONTROL BOX, PAINTED	1
16.	20973	COVER, CONTROL PANEL, PAINTED	1
17.	20974	HINGE, COVER	2
18.	20976	STUD, 1/4-20 X 6	1
19.	20983	COVER, CONTROL PANEL, TOGGLE	1
20.	20999	SWITCH, SPST, QC	1
21.	21069	FOAM TAPE, 1/2 X 1/16	10”
22.	21607	PMS #10-32 UNC X 3/4	8
23.	23281	FRONT, CANISTER PLUG PLATE	1
24.	F03LW	LOCKWASHER, #10 ZP	8
25.	F06PW	WASHER, 13/32 X 13/16 X 1/16	6
26.	F0332HN	NUT, HEX #10-32 ZP	8
27.	F0420FN	FLANGE WHIZ LOCK NUT, 1/4-20	9
28.	F0616ELN	LOCKNUT, 3/8-16 ZP	4
29.	F042004FWS	FWS, 1/4-20 X 1/4 ZP	4
30.	F042006FWS	FWLS, 1/4-20 X 3/4	6
31.	F061640CB	CAR BOLT, 3/8-16 X 5	2





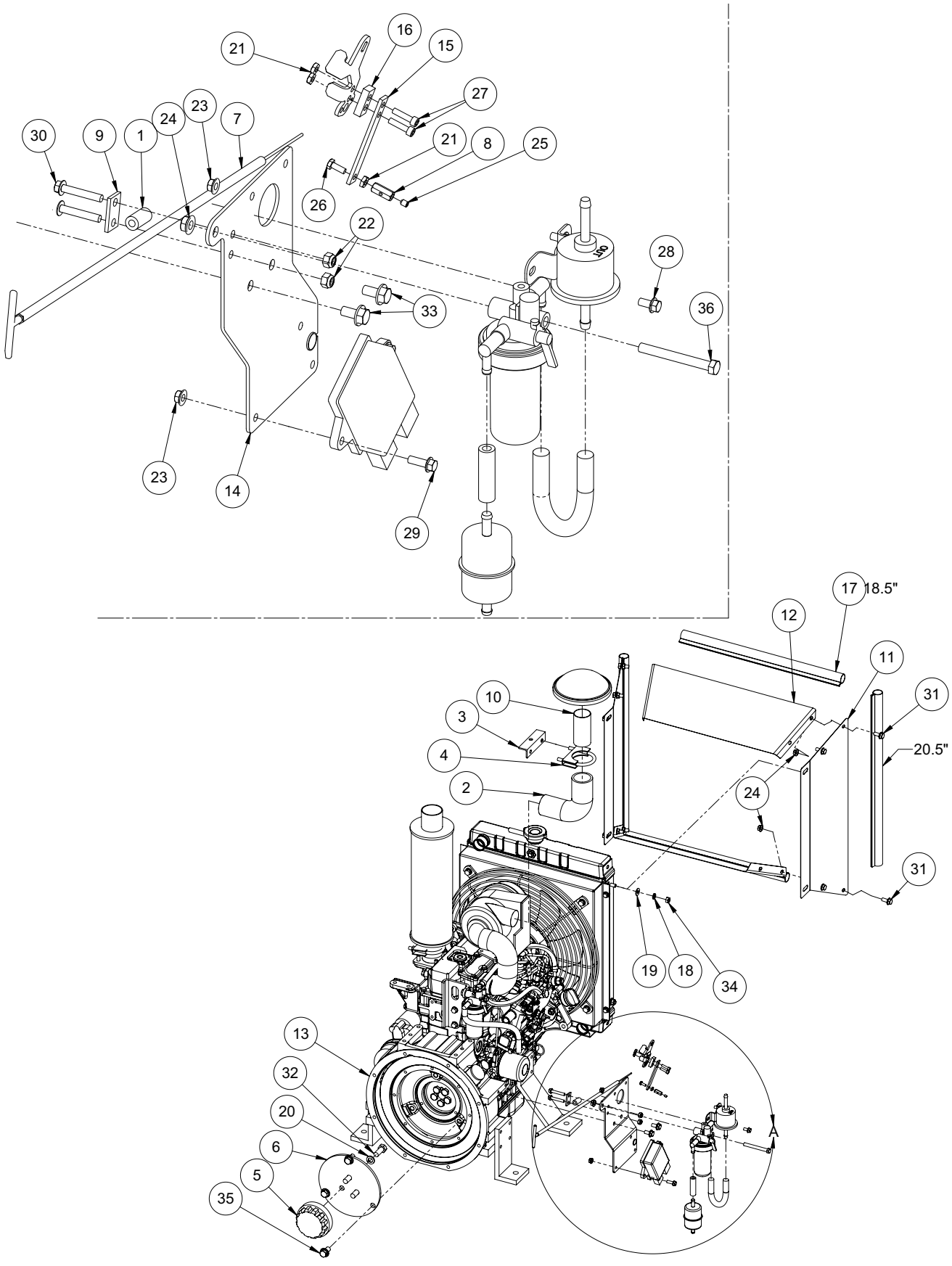
Plug Assembly

ITEM	PART NO.	DESCRIPTION	QTY
1.	05803	MALE PIPE ADAPTER	1
2.	06377	WIRE, BULK, BLACK	8”
3.	08427	WIRE, BULK, WHITE	8”
4.	08431	WIRE, BULK, GREEN	8”
5.	11444	TERMINAL, FEMALE DISCONNECT	2
6.	12302	TERMINAL, SLEEVE	6
7.	12304	SEAL, CONNECTOR WIRE	6
8.	12309	CONNECTOR TOWER (M) 6 POS	1
9.	12337	TUBE, HEAT SHRINK	2”
10.	19476	PLUG, 4 CONDUCTOR, MALE	1
11.	19477	SET SCREW, 8-32 X 1/4, POINTED	1
12.	20196	DOWEL PIN, .25 X 1.25	1
13.	20205	SOCKET, VEU PLUG	1
14.	20220	CORD GRIP, 3/4 NPT	1
15.	20589	INSULATOR, DELRIN	1
16.	20591	CORD, BULK, 18GA, 2 WIRE	1
17.	20996	HORN, 12V, LOW NOTE	1
18.	22465	FUSE HOLDER, INLINE	1
19.	22466	FUSE, MINI, 2 AMP	1
20.	F051804FWS	FWLS, 5/16-18 X 1/2 ZP	1
21.	F051804SSS	SSS, 5/16-18 X 1/2”	1
	20592	PLUG ASM (INCLUDES ITEMS 1-19)	1



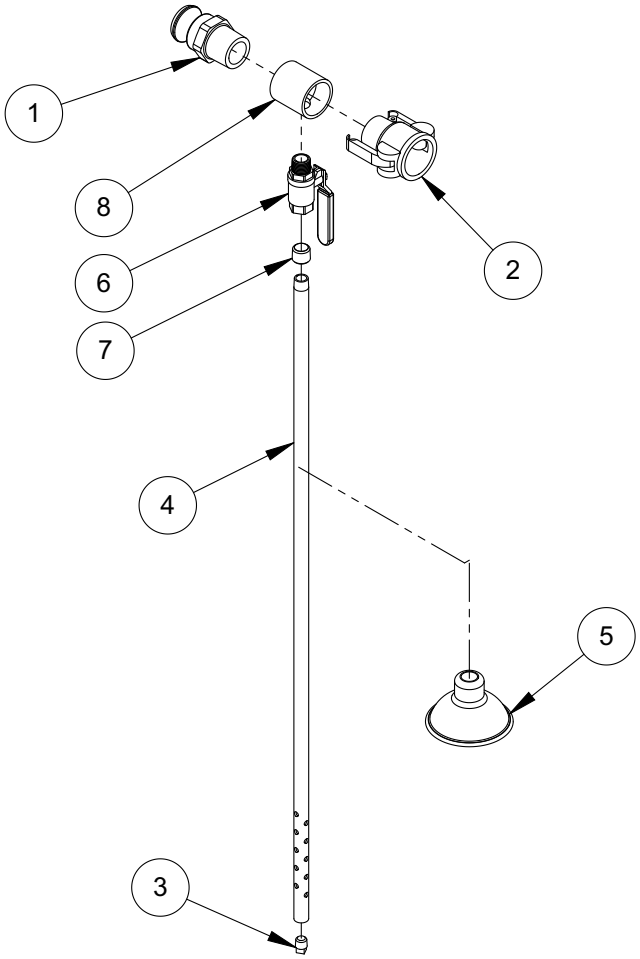
Door Assembly

ITEM	PART NO.	DESCRIPTION	QTY
1.	20110	DOOR HANDLE, SNAP IN	1
2.	20111	EDGING, DOOR	21”
3.	20112	LATCH, DOOR	2
4.	20113	PANEL, DOOR	1
5.	20239	DECAL, VEU DOOR	1
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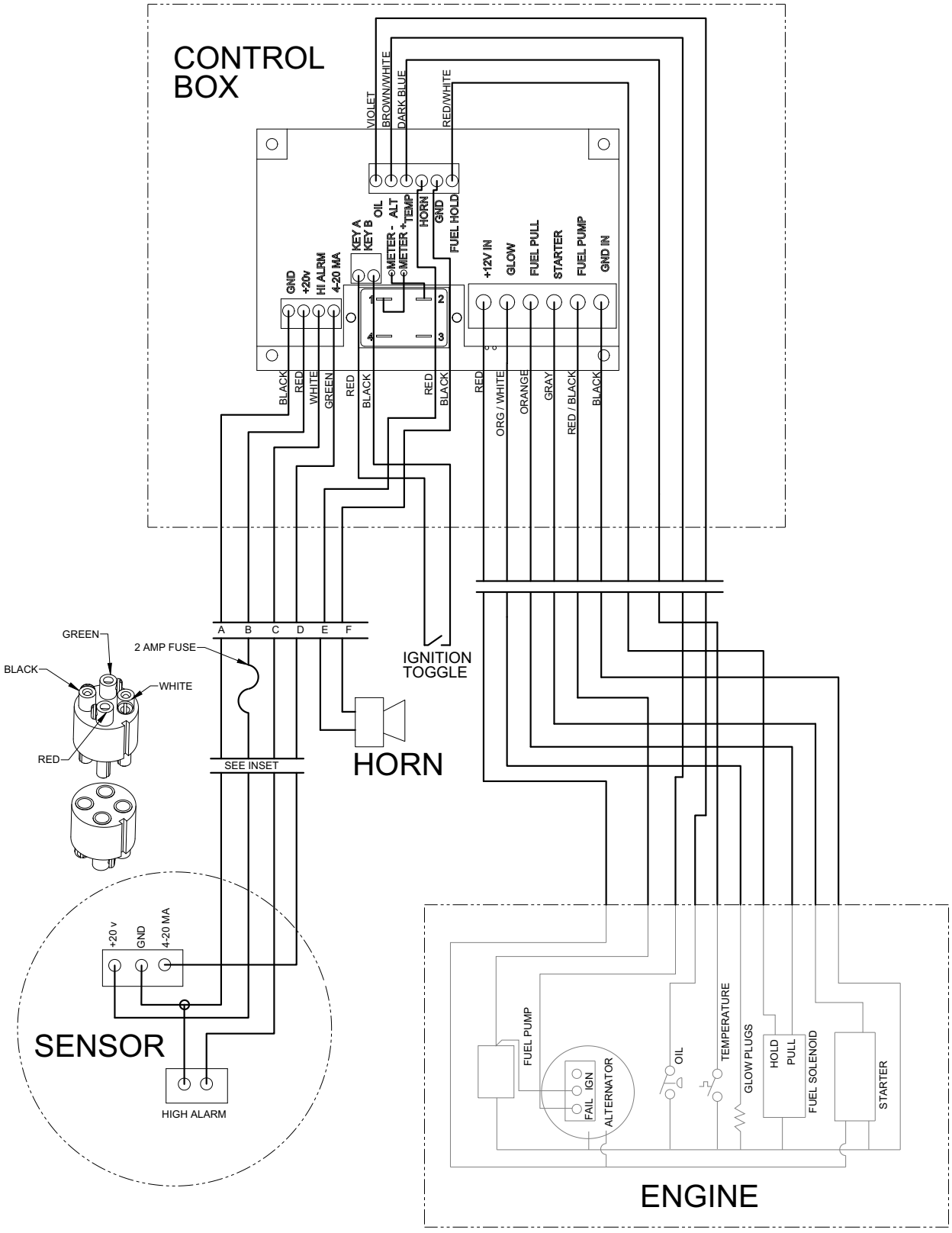
Engine Assembly

ITEM	PART NO.	DESCRIPTION	QTY
1.	06029	FUEL LINE, 1/4” BULK	1
2.	09214	PIPE, INLET	1
3.	20059	BRACKET, INTAKE	1
4.	20060	EXHAUST CLAMP, 2”	1
5.	20131	COUPLER, GEARGRIP, 1-7/16	1
6.	20133	ADAPTER PLATE, 3CB1	1
7.	20136	CABLE, THROTTLE CONTROL	1
8.	20138	THROTTLE CLAMP SWIVEL	1
9.	20140	THROTTLE CABLE CLAMP	1
10.	20147	TUBE, INTAKE	1
11.	20197	RAD SHROUD, SIDE, PAINTED	2
12.	20198	RAD SHROUD, TOP, PAINTED	2
13.	20961	ENGINE ASM, ISUZU 3CH1 (INCLUDES ITEMS 1-36)	1
14.	20964	THROTTLE BRACKET, PAINTED	1
15.	20965	THROTTLE EXTENSION	1
16.	20967	THROTTLE SPACER	1
17.	20995	SEAL, EDGE GRIP	78”
18.	F05LW	LOCKWASHER, 5/16 ZP	4
19.	F05SW	WASHER, 5/16 X 3/4 X 15GA ZP	4
20.	F08LW	LOCKWASHER, 1/2 ZP	3
21.	F0324HN	NUT, HEX #10-24 ZP	3
22.	F0420ELN	LOCKNUT, 1/4-20 NYLOC	2
23.	F0420FN	FLANGE WHIZ-LOCK NUT 1//4-20	4
24.	F0518FN	NUT, FLANGE WHIZ-LOCK 5/16-18 ZP	9
25.	F032402SSS	SSS, #10-24 X 1/4	1
26.	F032404HCS	HHCS, #10-24 X 1/2 GR5 ZP	1
27.	F032406SCS	SCS, #10-24 X 3/4	2
28.	F042004FWS	FWLS, 1/4-20 X 1/2 ZP	2
29.	F042006FWS	FWLS, 1/4-20 X 3/4 ZP	2
30.	F0420012FWS	FWLS, 1/4-20 X 1-1/2 ZP	2
31.	F051806FWS	FWLS, 5/16-18 X 3/4 ZP	8
32.	F081310HCS	HHCS, 1/2-13 X 1-1/4 GR5 ZP	3
33.	M08C016FWS	FWS, M8 X 16	2
34.	M08CHN	NUT, HEX M8 X 1.25 ZP	4
35.	M12C020FWS	FWS, M12 X 20	3
36.	F051822HCS	HHCS, 5/16-18 X 2-3/4 GR5 ZP	1
	20352	ISUZU OIL FILTER	
	20351	ISUZU AIR FILTER	
	20353	ISUZU CARTRIDGE FUEL FILTER	
	21040	ISUZU INLINE FUEL FILTER	



Probe and Hose Assemblies

ITEM	PART NO.	DESCRIPTION	QTY
1.	19185	COUPLING, 1-1/4 NPT, CAM LOCK	1
2.	19186	COUPLING, 1-1/4 NPTM, HOSE F	1
3.	19187	SQ HD PIPE PLUG, 1/4 NPT, ALUM	1
4.	19188	PIPE, PROBE	1
5.	19348	CUP, VACUUM	1
6.	20985	BALL VALVE, 1/2 NPT	1
7.	20986	PIPE BUSHING, 3/8-1/2 NPT	1
8.	20987	HEAD, PROBE, HI FLOW	1
	20984	PROBE ASM, HIGH FLOW (INCLUDES ITEMS 1-7)	
	19049	CAM & GROOVE HOSE ASM, 1-1/4 x 5'	
	19050	CAM & GROOVE HOSE ASM, 1-1/4 x 25'	
	19810	CAM & GROOVE HOSE ASM, 3” x 25'	
	19874	MAN HOLE KIT	
	19051	PROBE KIT (5’ HOSES)	
	19927	PROBE KIT (10’ HOSES)	



Wiring Schematic

NOTES

WARRANTY

1.IN GENERAL - The warranties described in this document are provided by M-B-W, INC. and MBW EUROPE, LTD. ("MBW") to define what is, what is not, and for how long machines and parts are covered against material defects and/or defective workmanship. To obtain warranty service, the purchaser must, within the Warranty Period (defined in Paragraph 3): (i) report the product defect to an authorized repair center, (ii) make a written request for repair, (iii) provide proof of purchase to the authorized repair center, and (iv) deliver the equipment to the authorized repair center. A list of authorized repair centers is available on the MBW website (mbw.com) or by contacting MBW at 800-678-5237.

2.COVERED - MBW's obligation under this limited warranty is limited to the cost of the parts and the labor to repair any defect in material and/or workmanship at an authorized MBW repair center. Transportation charges are not covered by this limited warranty.

3.WARRANTY PERIODS - The Warranty Period begins on, as applicable: (i) the product purchase date by an end user or (ii) the first day the product is put into rental or two years after invoice date from MBW to Dealer, whichever starts the warranty period first. To insure that your warranty is in place, fill out the warranty card and mail it in or register your product online at www.mbw.com/service-support/warranty-registration. The warranty is nontransferable.

The Warranty Period ends after:

A.New Ground compaction equipment - 2 years.
B.New Concrete finishing equipment - 1 year.
C.New Utility equipment - 1 year.
D.Demonstration equipment - 6 months.
E.Wear parts: lubricants, filters, belts and shock mounts - 30 days.

4.NOT COVERED- This warranty does not include, and MBW specifically excluded from any warranty:

A.Used equipment - all used equipment is not warranted and is sold 'as is' 'where is' with all defects.
B.Replacement electrical parts, including but not limited to: electric motors, circuit boards, switches, are not warranted or returnable.
C.OEM: engines, batteries, and chargers. Those warranties are covered by the manufacturer.
D.Consumable parts: trowel and screed blades.
E.Equipment that has been: altered, abused, neglected, not maintained, or modified to run outside its specifications. Any modification to the machine or its parts makes this warranty null and void.
F.Other: damage to a product from normal wear, air freight, overtime, pickup and delivery, temporary replacement rentals, freight damage, or other similar incidents.
G.Product used in a fashion it was not designed for.
H.Parts and labor not performed by authorized dealers.

It is at MBW's discretion if warranty applies and has the right to adjusts labor rates on a claim by claim basis.

5.OTHER - IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXLUSIVE REMEDY UNDER THIS WARRANTY. UNDER NO CIRCUMSTANCES SHALL MBW BE LIABLE FOR ANY COSTS, LOSS, EXPENSE, DAMAGE, SPECIAL DAMAGES, DIRECT DAMAGES, INCIDENTAL DAMAGES, EXEMPLARY, CONSEQUENTIAL, OR PUNITIVE DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE USE OF MBW PRODUCT OR DAMAGES FOR LOSS OF USE, LOSS OF ANTICIPATED PROFITS, INCOME, OR ECONOMIC LOSSES OF ANY KIND. **MBW'S** LIABILITY TO BUYER UNDER THESE WARRANTIES FOR THE PRODUCT IS LIMITED AS SET FORTH HEREIN, WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY **OR ANY OTHER THEORY OF LIABILITY, INCLUDING BUT NOT LIMITED TO FRAUD, MISREPRESENTATION, BREACH OF CONTRACT, PERSONAL INJURY, PRODUCTS LIABILITY OR ANY OTHER THEORY.**

MBW'S LIABILITY UNDER ANY WARRANTY HEREUNDER, WHETHER EXPRESS OR IMPLIED, SHALL NOT EXCEED THE COST OF REPAIR OR REPLACEMENT OF DEFECTIVE PARTS OF THE PRODUCT OR THE PRODUCT. BUYER MAY NOT BRING ANY ACTION UNDER THESE WARRANTIES MORE THAN ONE YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED.

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MBW NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME ON BEHALF OF MBW ANY OTHER LIABILITY OR WARRANTY IN CONNECTION WITH THE SALE OR SERVICE OF ANY MBW PRODUCT.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.