



# Parts Manual

Mfg. No: 040547-01  
20,000 Watt Standby Generator (B&S  
Fortress)



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Not For  
Reproduction

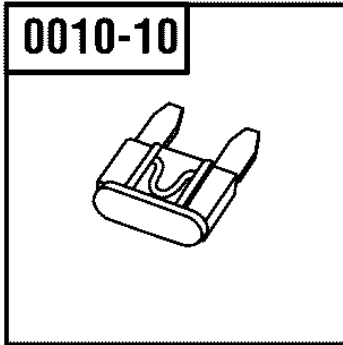
# Accessory Group

Note: Unless noted otherwise, use the standard torque specifications

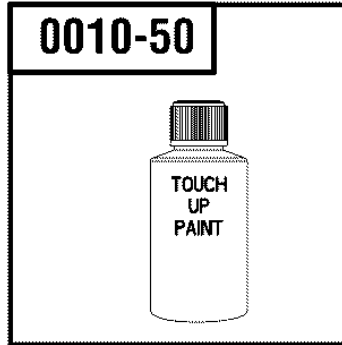
Mfg. No: 040547-01

## 0010

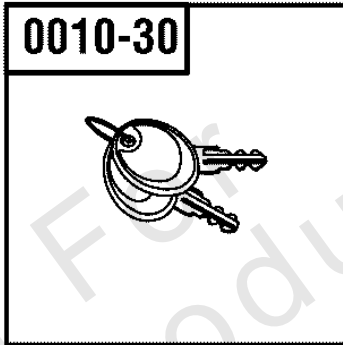
0010-10



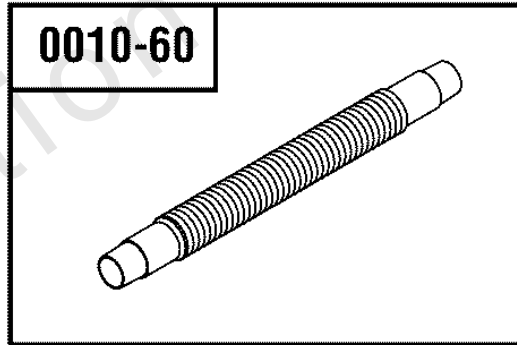
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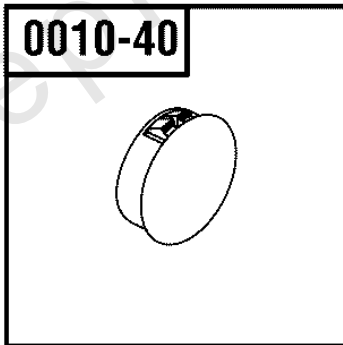
0010-30



0010-60



0010-40



0010-70

<p><b>ATTENTION</b> This building is equipped with a Standby Generator.</p> <p><b>FUEL TYPE:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Natural Gas</li> <li><input type="checkbox"/> LP Gas</li> </ul> <p><b>LOCATION:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> NORTH    <input type="checkbox"/> EAST</li> <li><input type="checkbox"/> SOUTH    <input type="checkbox"/> WEST</li> </ul> <p><b>ATENCIÓN</b> Este edificio está equipado con un generador de respaldo.</p> <p><b>TIPO DE COMBUSTIBLE:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Gas natural</li> <li><input type="checkbox"/> Gas LP</li> </ul> <p><b>UBICACIÓN:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> NORTE    <input type="checkbox"/> ESTE</li> <li><input type="checkbox"/> SUR    <input type="checkbox"/> OESTE</li> </ul> <p style="text-align: center;">FRONT</p>	<p><b>ATTENTION</b> Cet édifice est équipé d'une génératrice de secours.</p> <p><b>TYPE DE CARBURANT :</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Gaz naturel</li> <li><input type="checkbox"/> GPL</li> </ul> <p><b>EMPLACEMENT :</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> EST    <input type="checkbox"/> NORD</li> <li><input type="checkbox"/> OUEST    <input type="checkbox"/> SUD</li> </ul> <p><b>ATTENTION</b> This building is equipped with a Standby Generator.</p> <p><b>FUEL TYPE:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Natural Gas</li> <li><input type="checkbox"/> LP Gas</li> </ul> <p><b>LOCATION:</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> EAST    <input type="checkbox"/> NORTH</li> <li><input type="checkbox"/> WEST    <input type="checkbox"/> SOUTH</li> </ul> <p style="text-align: center;">BACK</p>
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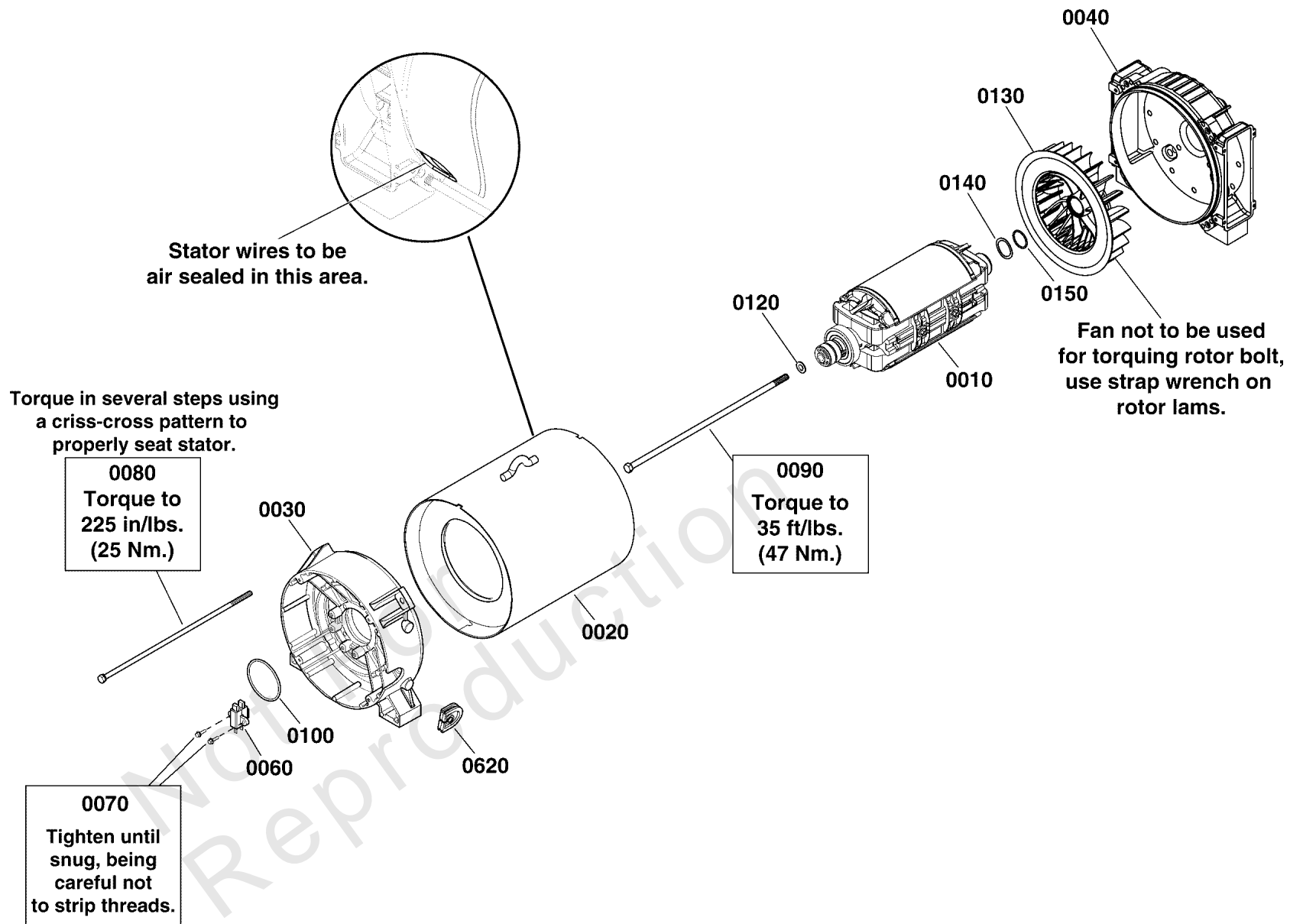
## Accessory Group

REF NO	PART NO	QTY	DESCRIPTION
0010	770022		KIT, Accessory -(Includes all items shown in box)
0010-10	198573GS		FUSE
0010-30	314290GS		KEY
0010-40	198460GS		PLUG, Dome
0010-50	319693GS		PAINT, Touch Up, Cont. Charcoal, Texture
0010-60	311713GS		HOSE, Flex Fuel
0010-70	706988		DECAL
--	319677GS		PAINT, Spray, Cont. Charcoal, Texture -(Optional Accessory)
--	314941GS		BATTERY WARMER -(Optional Accessory)
--	6036		KIT, Maintenance -(Optional Accessory)
--	6229		KIT, Wireless Monitor -(Optional Accessory)
--	6231		KIT, Cold Weather (Includes Battery & Oil Warmers) -(Optional Accessory)
--	6254		KIT, Oil Warmers -(Optional Accessory)
--	6331		KIT, Fuel Regulator (Low Pressure Applications Only) -(Optional Accessory)

# Alternator Group

Note: Unless noted otherwise, use the standard torque specifications

Mfg. No: 040547-01



## Alternator Group

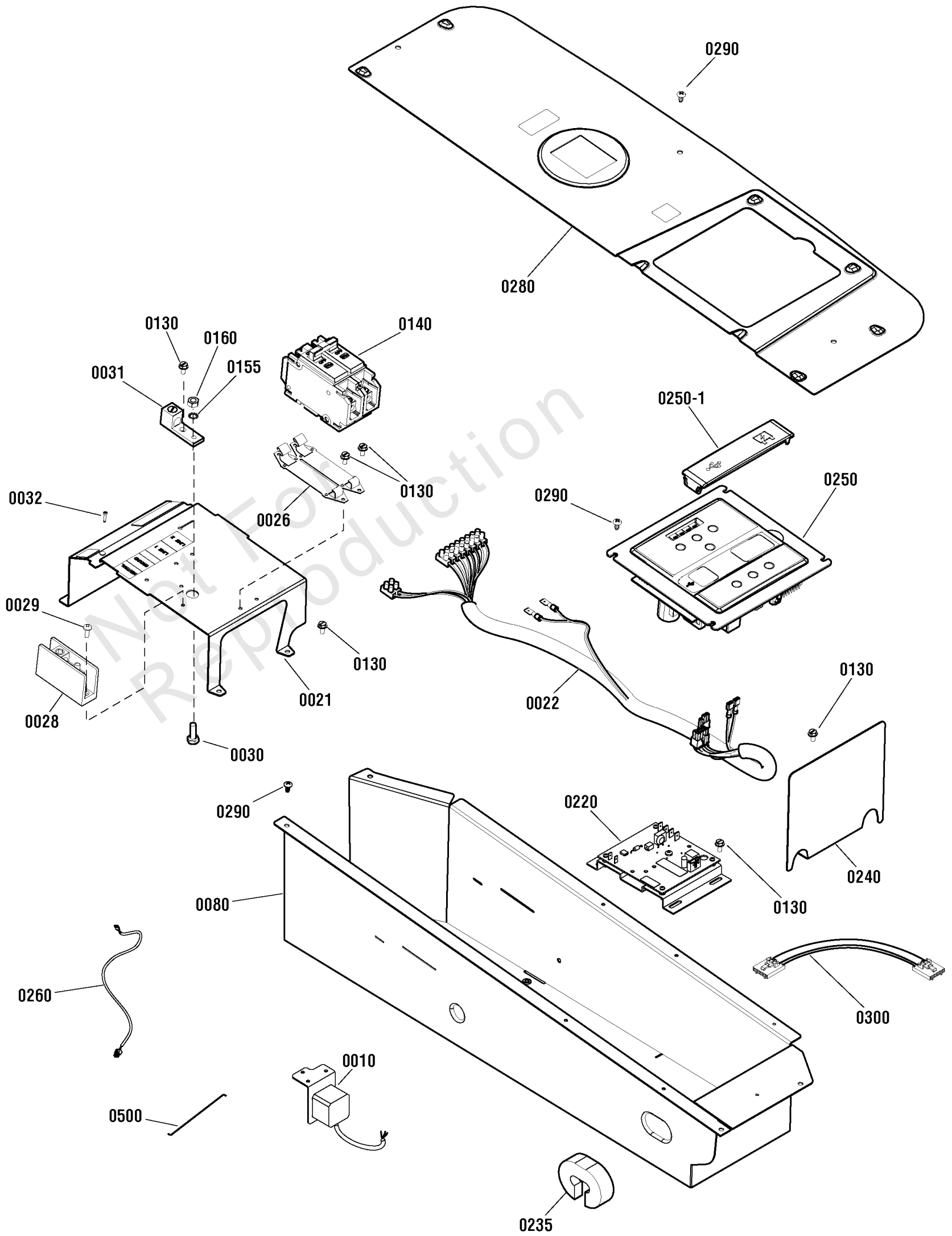
REF NO	PART NO	QTY	DESCRIPTION
0010	709463		ROTOR
0020	314666GS		STATOR
0030	195234GS		RBC
0040	195235GS		ADAPTER, Engine
0060	66386GS		BRUSH ASSEMBLY
0070	66849GS		TAPTITE
0080	315199GS		SCREW
0090	315204GS		BOLT
0100	199888GS		O-RING
0120	203200GS		WASHER
0130	319105GS		FAN
0140	319110GS		WASHER
0150	319111GS		O-RING
0620	315440GS		GROMMET

Not For Reproduction

# Control Panel Group

Note: Unless noted otherwise, use the standard torque specifications

Mfg. No: 040547-01





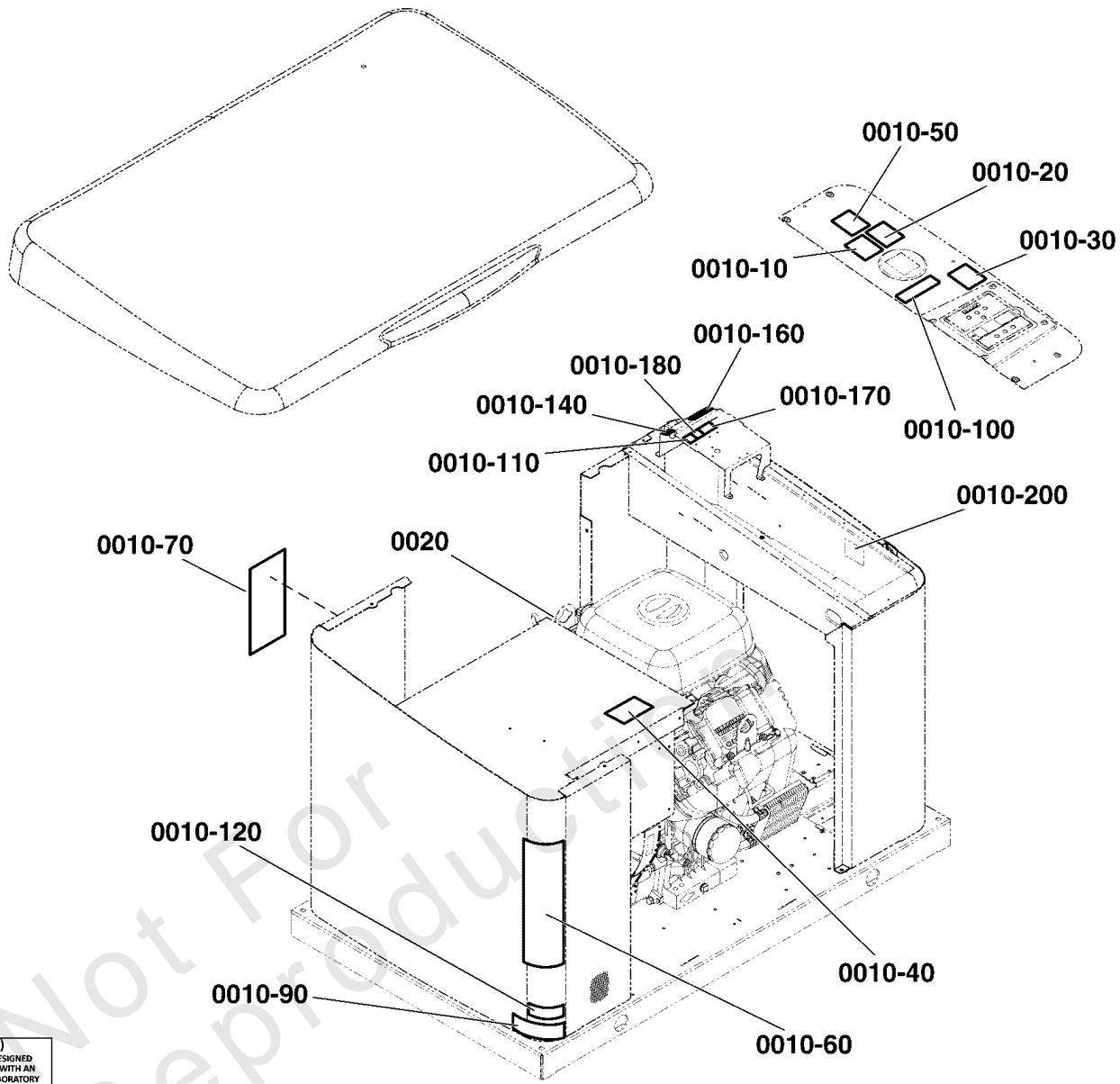
## Control Panel Group

REF NO	PART NO	QTY	DESCRIPTION
0010	707181		MOTOR, Stepper
0021	314633GS		BRACKET
0022	314639GS		HARNESS-WIRE
0026	192770GS		BRACKET, Mounting / Breaker
0028	208365GS		BLOCK, Terminal
0029	-----		* SCREW, #10-32 x 3/4 -(*See footnote)
0030	-----		* CAPSCREW, Hex Head, 1/4-20 x 3/4 -(*See footnote)
0031	199011GS		LUG, Ground Connect
0032	-----		* SCREW, M2.5-0.45 x 12 -(*See footnote)
0080	314631GS		BOX, Control
0130	-----		* BOLT, Hex Head, #10-32 x 3/8 -(*See footnote)
0140	311318GS		BREAKER, Circuit, 100A
0155	-----		* WASHER, External Lock, M6 -(*See footnote)
0160	-----		* NUT, 1/4-20 -(*See footnote)
0220	315445GS		REGULATOR, Voltage
0235	708727		SEAL
0240	314632GS		BRACKET
0250	315423GS		CONTROL PANEL -(**See Footnote)
0250-1	319009GS		DOOR, Access
0260	317480GS		HARNESS, Wiring
0280	BA314635GS		COVER, Control Panel Box
0290	-----		* SCREW, #10-16 x 3/8 -(*See footnote)
0300	709873		HARNESS, Wire -(Voltage Regulator)
0500	317323GS		ROD
0510	198573GS		FUSE, Auto Type, 15 Amp -(Not Illustrated)
0520	6479		KIT, Off Board Radio -(Not Illustrated)

### Footnotes:

\*\* If system has a wireless monitor, 6479GS (Off Board Radio Kit) will be required along with control panel.

\* Items without part numbers are common fasteners. Purchase locally.



**NFPA 37.4.1.4(2)**  
**THIS GENERATOR HAS BEEN DESIGNED AND TESTED IN CONJUNCTION WITH AN INDEPENDENT FIRE TESTING LABORATORY FOR 18" MINIMUM CLEARANCE FROM COMBUSTIBLE CONSTRUCTION**

0020

**0010**

**WARNING AVERTISSEMENT ADVERTENCIA**

Generator starts automatically which could result in serious injury. Remove control panel fuse and disconnect battery prior to servicing.  
 La generatrice démarre automatiquement, ce qui pourrait entraîner des blessures graves. Retirez le fusible du panneau de contrôle et débranchez la batterie avant d'effectuer un entretien.  
 El generador arranca automáticamente, lo que podría causar lesiones serias. Retire el fusible del panel de control y desconecte la batería antes de realizar algún servicio.

0010-10

**WARNING AVERTISSEMENT ADVERTENCIA**

Risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.  
 Risque de décharge électrique. Ne pas retirer la couverture. Aucune pièce à entretenir par l'utilisateur à l'intérieur. Confier l'entretien à du personnel de service qualifié.  
 Riesgo de descarga eléctrica, no quite la cubierta. No hay partes que puedan ser reparadas por el usuario en el interior. Haga que personal calificado realice el servicio.

0010-20

**WARNING AVERTISSEMENT ADVERTENCIA**

To reduce the risk of fire, replace only with same type and rating of fuse.  
 15AMP TYPE ATO  
 Pour réduire le risque d'incendie, remplacez avec un fusible de même type et classification.  
 15 A TYPE ATO  
 Para reducir el riesgo de incendio, reemplazelo solamente con un fusible del mismo tipo y capacidad.  
 15AMP TIPO ATO

0010-30

**WARNING AVERTISSEMENT ADVERTENCIA**

Hot surface could result in serious injury. Do not touch.  
 La surface chaude pourrait entraîner des blessures graves. Ne touchez pas.  
 La superficie caliente podría causar lesiones serias. No tocar.

0010-40

**WARNING AVERTISSEMENT ADVERTENCIA**

Failure to read & follow Operator and installation manuals could result in death or serious injury.  
 Ne pas lire et respecter les manuels de l'utilisateur et d'installation pourrait entraîner des blessures graves ou la mort.  
 No leer y seguir las indicaciones de los manuales de operación e instalación podría causar la muerte o lesiones serias.

0010-50

**L1**  
**L2**

0010-170

**WARNING AVERTISSEMENT ADVERTENCIA**

Control and Reproductive Harm  
 www.P65Warnings.ca.gov  
 Cancer and Troubles de l'Appareil Reproducteur  
 www.P65Warnings.ca.gov  
 Cáncer y Problemas Reproductivos  
 www.P65Warnings.ca.gov

0010-200

**WARNING AVERTISSEMENT ADVERTENCIA**

Engine exhaust contains carbon monoxide, a poisonous gas that could fill you in minutes. You cannot smell it or see it. Install outdoors only. Install carbon monoxide alarm in home.  
 Hot surface could result in serious injury. Do not touch.  
 Engine exhaust could ignite combustibles resulting in death or serious injury. Exhaust side min clearance from any structures, shrubs, trees or any vegetation.  
 This equipment may create sparks that could start fires around dry vegetation. A spark arrester may be required. Contact local fire agencies for regulations relating to fire prevention requirements.  
 L'échappement du moteur contient du monoxyde de carbone, un gaz toxique pouvant tuer en quelques minutes. Vous ne pouvez ni le sentir ni le voir. Installez à l'extérieur seulement. Installez les alarmes de monoxyde de carbone dans la maison.  
 La surface chaude pourrait entraîner des blessures graves. Ne touchez pas.  
 L'échappement du moteur peut enflammer les combustibles, ce qui peut provoquer des blessures graves, voire la mort. La sortie pour l'échappement de l'encinte à l'épreuve des intempéries doit avoir un dégagement d'au moins 1,5 m (5 pi) de toutes structures, buissons, arbres ou autres végétaux.  
 Cet équipement peut produire des étincelles pouvant déclencher des incendies autour de la végétation sèche. Un pare-étincelles pourrait être nécessaire. Contactez les responsables locaux des incendies pour connaître les exigences réglementaires liées à la prévention des incendies.  
 Los gases de escape del motor contienen monóxido de carbono, un gas venenoso que podría matarlo en minutos. No puede verlo ni olerlo. Instale solamente en exteriores. Instale alarmas de monóxido de carbono en el hogar.  
 La superficie caliente podría causar lesiones serias. No tocar.  
 Los gases de escape del motor podrían incendiar materiales combustibles, lo que podría causar la muerte o lesiones serias. El lado de escape del gabinete impermeable debe tener un espacio libre de 5 pies (1,5 m) de distancia desde cualquier estructura, arbusto, árbol o cualquier vegetación.  
 Este equipo puede causar chispas que podrían iniciar incendios en la vegetación seca. Podría requerirse un supresor de chispas. Póngase en contacto con las agencias locales de combate a incendios para consultar las regulaciones referentes a requisitos de prevención de incendios.

0010-40

**CAUTION MISE EN GARDE PRECAUCIÓN**

Connect output of generator to suitably rated transfer switch in accordance with the Canadian Electrical Code, Part 1.  
 Branchez la sortie de la génératrice à un commutateur convertisseur de classification convenable, selon le Code canadien de l'électricité, partie 1.  
 Conecte la salida del generador a un interruptor de transferencia de la capacidad adecuada de acuerdo con el Código Eléctrico Canadiense, Parte 1.

0010-60

**NOTICE AVIS AVISO**

**FUEL REQUIREMENTS**  
 Estimated generator fuel supply requirements for both natural gas and LP vapor.

Vertical Model	Natural Gas		LP Vapor	
	BTU/h	m³/h	BTU/h	m³/h
8KW	121 000	3.43	141 000	1.82
10KW	159 000	4.73	184 000	1.86
12KW	172 000	4.86	209 000	2.36

Horizontal Model	Natural Gas		LP Vapor	
	BTU/h	m³/h	BTU/h	m³/h
15KW	240 000	6.80	272 500	3.09
16KW	244 000	6.91	282 500	3.20
17KW	248 000	7.02	295 000	3.34
20KW	290 000	7.98	337 500	3.82

FUEL TYPE	Inches of WC	mm of WC
Natural Gas	5-7	127-178
LP Vapor	11-14	279-356

**EXIGENCES EN MATIÈRE DE CARBURANT**  
 Approximativement approximatif en carburant pour le gaz naturel et le propane gazeux.

Modèle vertical	Gaz naturel		Propane gazeux	
	BTU/h	m³/h	BTU/h	m³/h
8KW	121 000	3.43	141 000	1.82
10KW	159 000	4.73	184 000	1.86
12KW	172 000	4.86	209 000	2.36

Modèle horizontal	Gaz naturel		Propane gazeux	
	BTU/h	m³/h	BTU/h	m³/h
15KW	240 000	6.80	272 500	3.09
16KW	244 000	6.91	282 500	3.20
17KW	248 000	7.02	295 000	3.34
20KW	290 000	7.98	337 500	3.82

Les exigences de pression d'admission de carburant à plein rendement sont:

TYPE DE CARBURANT	Pouces	mm
Gaz naturel	5-7	127-178
Propane gazeux	11-14	279-356

**REQUERIMIENTOS DE COMBUSTIBLE**  
 Requerimientos estimados de combustible para el generador para gas natural y gas LP.

Modelo vertical	Gas Natural		Gas LP	
	BTU/h	m³/h	BTU/h	m³/h
8KW	121 000	3.43	141 000	1.82
10KW	159 000	4.73	184 000	1.86
12KW	172 000	4.86	209 000	2.36

Modelo horizontal	Gas Natural		Gas LP	
	BTU/h	m³/h	BTU/h	m³/h
15KW	240 000	6.80	272 500	3.09
16KW	244 000	6.91	282 500	3.20
17KW	248 000	7.02	295 000	3.34
20KW	290 000	7.98	337 500	3.82

Los requerimientos de presión de entrada de combustible a carga completa son de:

Tipo de combustible	Pulgadas de columna de agua	mm de columna de agua
Gas natural	5-7	127-178
Gas LP	11-14	279-356

**WARNING AVERTISSEMENT ADVERTENCIA**

Explosion of battery gases could result in death or serious injury. Keep all sources of ignition away from battery. Battery contains acid which could result in blindness or severe burns. Avoid contact with acid.  
 L'explosion des gaz de la batterie peut provoquer des blessures graves, voire la mort. Tenez toutes les sources d'allumage éloignées de la batterie. La batterie contient de l'acide pouvant causer la cécité ou de sévères brûlures. Évitez le contact avec l'acide.  
 La explosión de los gases de la batería podría causar la muerte o lesiones serias. Mantenga todas las fuentes de ignición lejos de la batería. La batería contiene ácido que podría causar ceguera o quemaduras serias. Evite el contacto con el ácido.

0010-80

**WARNING AVERTISSEMENT ADVERTENCIA**

Explosion of battery gases could result in death or serious injury. Keep all sources of ignition away from battery. Battery contains acid which could result in blindness or severe burns. Avoid contact with acid.  
 L'explosion des gaz de la batterie peut provoquer des blessures graves, voire la mort. Tenez toutes les sources d'allumage éloignées de la batterie. La batterie contient de l'acide pouvant causer la cécité ou de sévères brûlures. Évitez le contact avec l'acide.  
 La explosión de los gases de la batería podría causar la muerte o lesiones serias. Mantenga todas las fuentes de ignición lejos de la batería. La batería contiene ácido que podría causar ceguera o quemaduras serias. Evite el contacto con el ácido.

0010-140

25  
26

0010-180

240 VAC 240 V CA 240 VCA 240 VAC 240 V CA 240 VCA

RAINPROOF ENCLOSURE ETANCHE À LA PLUIE ENCINTÉ GABINETE A PRUEBA DE LLUVIA

0010-150

GENERATOR SERVICE DISCONNECT GÉNÉRATRICE ENTRETIEN DÉBRANCHER DESCONNECTOR DE SERVICIO DEL GENERADOR

12VDC GND HLED THRGND TALK N/C COM N/D

0010-100

N

0010-160

0010-110

12VDC GND HLED THRGND TALK N/C COM N/D

0010-120

0010-190

0010-70

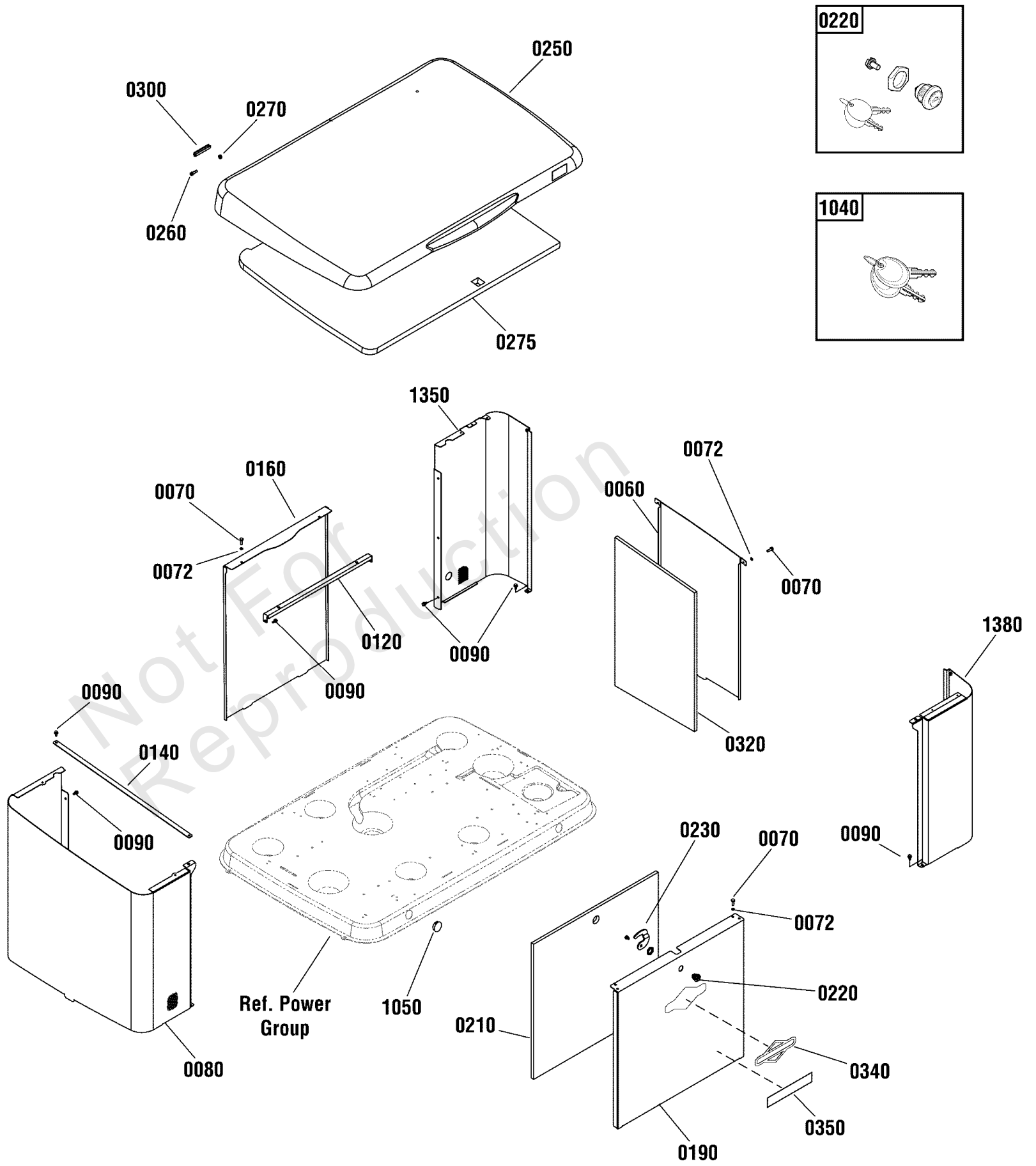
## Decals Group

REF NO	PART NO	QTY	DESCRIPTION
0010	707597	1	DECAL SHEET, Warnings -(Includes items 0010-10 thru 0010-200)
0010-10	-----	1	DECAL, Warning, Autostart
0010-20	-----	1	DECAL-WARNING, SHOCK
0010-30	-----	1	DECAL-WARNING, FUSE
0010-40	-----	1	DECAL-WARNING, HOT SURFACE
0010-50	-----	1	DECAL, Warning, Manual
0010-60	-----	1	DECAL-WARNING, EXHAUST
0010-70	-----	1	DECAL, Notice, Fuel Requirements
0010-80	-----	1	DECAL, Warning, Battery
0010-90	-----	1	DECAL, Rainproof Enclosure
0010-100	-----	1	DECAL-DISCONNECT
0010-110	-----	1	DECAL-NEUTRAL
0010-120	-----	1	DECAL, Neutral
0010-140	-----	1	DECAL-TERMINAL, 25/26
0010-150	-----	2	DECAL, 240 VAC
0010-160	-----	1	DECAL, Terminal Strip, Numbers 1-8
0010-170	-----	1	DECAL, L1/L2 Icon
0010-180	-----	1	DECAL-GROUND
0010-190	-----	1	DECAL, Terminal Strip, Numbers 8-1
0010-200	-----	1	DECAL, Warning -(The installation of this decal is required for units manufactured after 08/30/2018 and sold in the state of California.)
0020	-----	1	DECAL, Clearance From Combustible Construction

# Enclosure Group

Note: Unless noted otherwise, use the standard torque specifications

Mfg. No: 040547-01



## Enclosure Group

REF NO	PART NO	QTY	DESCRIPTION
0060	AR314694GS	1	PANEL, End, Right
0070	-----	6	* CAPSCREW, Hex Head, 1/4-20 x 3/4
0072	-----	6	* WASHER, External Lock, M6
0080	AR314645GS	1	PANEL, End, Left
0090	B4300GS	8	BOLT, 1/4-20 x 1/2
0120	314652GS	1	SUPPORT, Rail
0140	314638GS	1	SUPPORT, Rail
0160	AR314651GS	1	PANEL, Back
0190	770015	1	PANEL, Front
0210	315447GS	1	INSULATION
0220	314619GS	1	LATCH
0230	315443GS	1	LATCH, Arm
0250	770016	1	ROOF
0260	311644GS	4	SCREW, 5/16-18 x 1/2
0270	-----	4	* NUT, Flange, 1/4-20
0275	315452GS	1	INSULATION
0300	316954GS	1	TRIM
0320	315453GS	1	INSULATION
0340	770017	1	DECAL
0350	770458	1	BADGE, Fortress
1040	314290GS	1	KEY, Latch
1050	198460GS	1	PLUG
1350	AR314644GS	1	PANEL, Corner
1380	AR314681GS	1	PANEL, Corner
--	316193GS	1	PLUG, Roof -(Not Illustrated)

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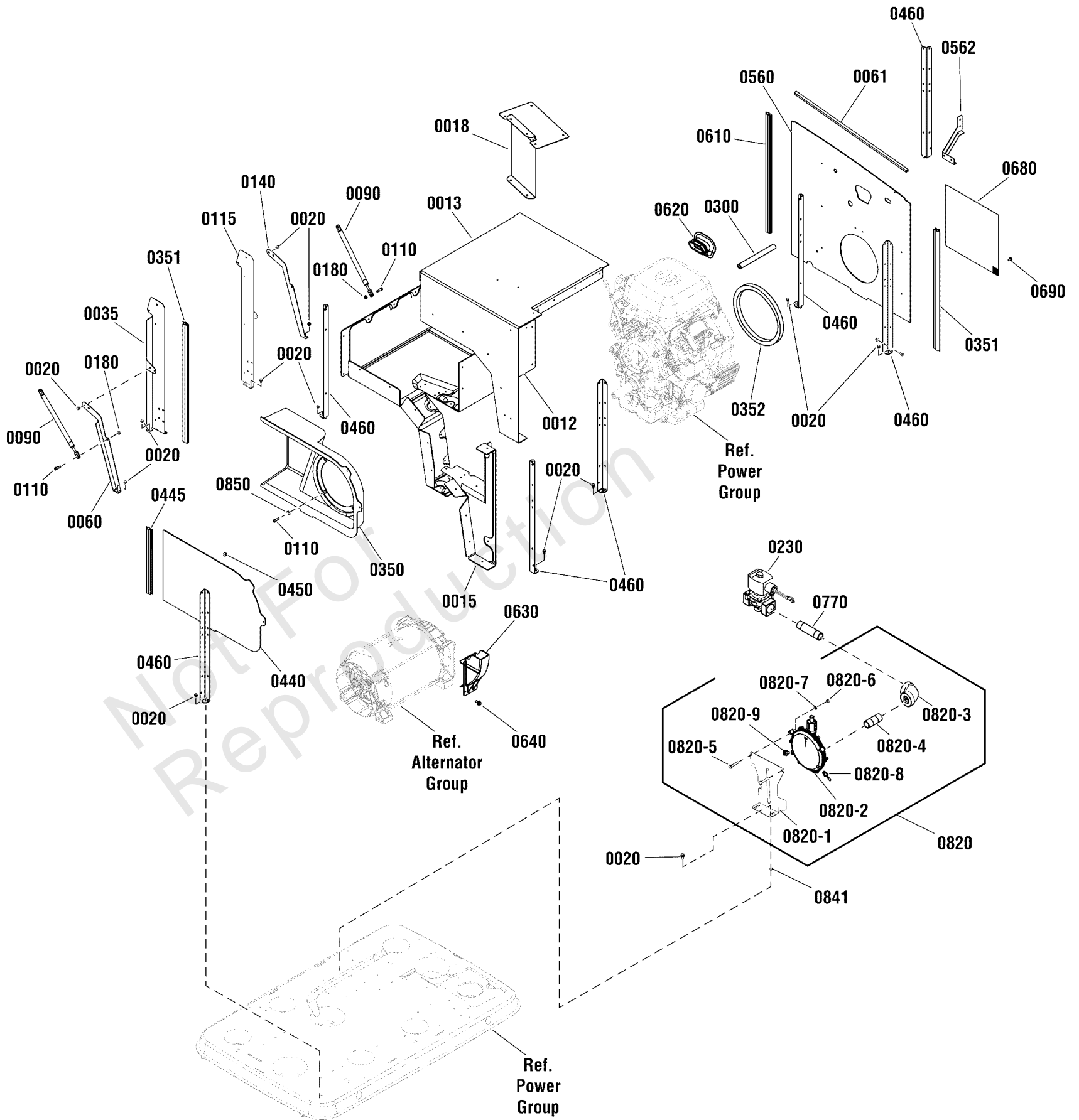
### Footnotes:

\* Items without part numbers are common fasteners. Purchase locally.

# Fuel, Duct & Support Group

Note: Unless noted otherwise, use the standard torque specifications

Mfg. No: 040547-01

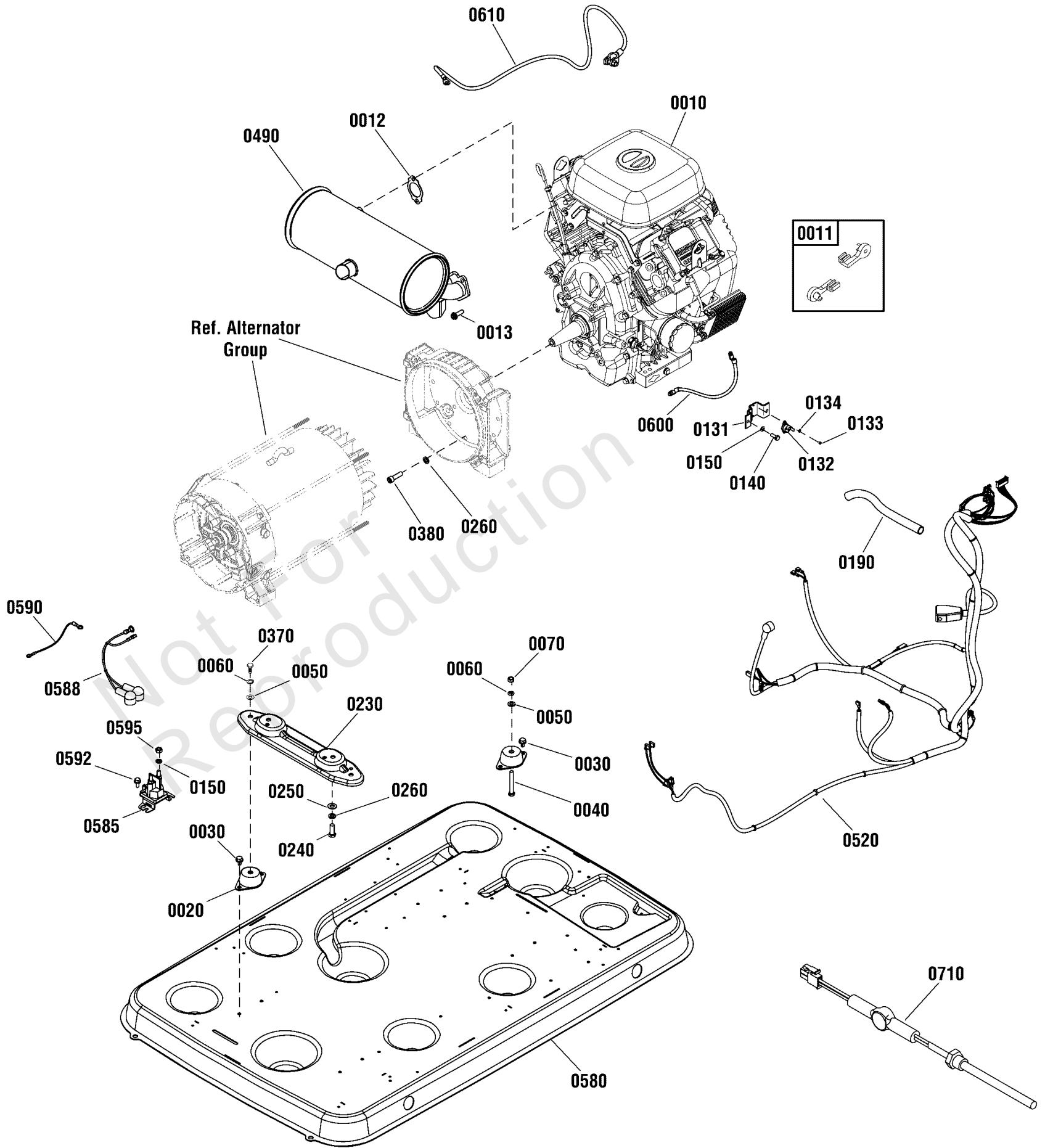


## Fuel, Duct & Support Group

REF NO	PART NO	QTY	DESCRIPTION
0012	314620GS		PANEL, Muffler, Bottom
0013	314621GS		PANEL, Muffler, Top
0015	314624GS		PANEL, Muffler
0018	318771GS		DEFLECTOR, Muffler
0020	B4300GS		BOLT, 1/4-20 x 1/2
0035	314679GS		BRACKET, Roof Support
0060	314672GS		BRACE
0061	316202GS		TRIM
0090	314649GS		SHOCK, Roof
0110	311644GS		SCREW, 5/16 x 1/2
0115	314647GS		BRACKET, Roof Support
0140	314646GS		BRACE
0180	-----		* NUT, Flange, 1/4-20
0230	318880GS		SOLENOID
0300	314662GS		TUBE
0350	314626GS		DUCT, Alternator
0351	311692GS		SEAL
0352	315454GS		SEAL
0440	314684GS		PANEL, Intake, Alternator
0445	314682GS		SEAL
0450	314661GS		CLIP
0460	314625GS		SUPPORT
0560	314683GS		PANEL, Intake, Engine
0562	315444GS		SUPPORT
0610	316951GS		SEAL
0620	314642GS		SNORKEL
0630	314628GS		DUCT
0640	-----		* SCREW, M5-0.8 x 10
0680	316194GS		SCREEN
0690	194561GS		SCREW, #10-32 x 3/8
0770	318459GS		FITTING
0820	771014		FUEL REGULATOR ASSEMBLY -(Includes Ref. Nos. 0820-1, 0820-2, 0820-3, 0820-4, 0820-5, 0820-6, 0820-7, 0820-8 & 0820-9)
0820-1	706379		BRACKET
0820-2	847105GS		REGULATOR, With Valve, LP/NG Selector
0820-3	312781GS		ELBOW
0820-4	206976GS		FITTING
0820-5	-----		* CAPSCREW, Hex Head, M6-1.0 x 30
0820-6	-----		* NUT, Hex, M6-1
0820-7	-----		* WASHER, Lock, 1/4
0820-8	314693GS		FITTING, Barb
0820-9	318002GS		FITTING
0841	-----		* WASHER, Lock, 1/4
0850	71693GS		WASHER, Fender, 5/16
--	6358		KIT, Fuel Regulator (Low Pressure Applications Only) -(Optional Accessory - Not Included)

### Footnotes:

\* Items without part numbers are common fasteners. Purchase locally.





## Power Group

REF NO	PART NO	QTY	DESCRIPTION
0010	-----	1	**ENGINE -(**See footnote)
0011	845699		CLEVIS
0012	809872		GASKET, Exhaust
0013	-----		* SCREW, M8 x 25 -(*See footnote)
0020	187594GS		MOUNT, Vibration
0030	24910GS		*CAPSCREW, Hex Head, Trilobular, 5/16, 18 x 1/2
0040	-----		* CAPSCREW, Hex Head, 5/16-18 x 2-1/2 -(*See footnote)
0050	-----		* WASHER, Flat, M8 -(*See footnote)
0060	-----		* WASHER, Lock, M8 -(*See footnote)
0070	-----		* NUT, 5/16-18 -(*See footnote)
0131	313561GS		PLATE, Temp Switch
0132	204426GS		SWITCH, Temperature
0133	708730		SCREW
0134	-----		* WASHER, Shakeproof, #4 -(*See footnote)
0140	47411GS		SCREW
0150	-----		* WASHER, Lock, 1/4 -(*See footnote)
0190	5048681SM		HOSE, OIL DRAIN
0230	B198896GS		BRACKET, Mounting Alternator, Black
0240	-----		* CAPSCREW, Hex Head, 3/8-16 x 1 -(*See footnote)
0250	-----		* WASHER, Flat, M10 -(*See footnote)
0260	-----		* WASHER, Lock, 3/8 -(*See footnote)
0370	-----		* CAPSCREW, Hex Head, 5/16-18 x 3/4 -(*See footnote)
0380	23645GS		SOCKET HEAD CAP SCREW, 3/8-16 x 1-1/4"
0490	314663GS		MUFFLER
0520	314637GS		HARNESS, Wiring
0580	706061		BASE
0585	691656		SOLENOID, Starter
0588	316188GS		HARNESS
0590	316961GS		WIRE, Ground Relay
0592	B4300GS		SCREW, Hex Washer Head, Taptite, 1/4-20 x 1/2
0595	-----		* NUT, 1/4-20 -(*See footnote)
0600	706527		WIRE, Ground
0610	314640GS		WIRE, Battery, Ground
0710	771985	1	HEATER, Oil, 55W, 240V

### Footnotes:

\* Items without part numbers are common fasteners. Purchase locally.

\*\* To verify your specific engine model, please reference the ID Tag located on your engine. See your local Briggs & Stratton distributor for parts and service.

# Hardware Identification & Torque Specifications

Torque Specification Chart								
FOR STANDARD METRIC MACHINE HARDWARE (Tolerance ± 20%)								
Property Class	5.6		8.8		10.9		12.9	
	Class 5.6		Class 8.8		Class 10.9		Class 12.9	
Size Of Hardware	in/lbs	Nm.	in/lbs	Nm.	in/lbs	Nm.	in/lbs	Nm.
	ft/lbs		ft/lbs		ft/lbs		ft/lbs	
M3	5.88	.56	13.44	1.28	19.2	1.80	22.92	2.15
M4	13.44	1.28	30.72	2.90	43.44	4.10	52.56	4.95
M5	26.4	2.50	60.96	5.75	5.97	8.10	7.15	9.7
M6	44.64	4.3	7.3	9.9	10.3	14	12.1	16.5
M7	5.2	7.1	12.1	16.5	16.9	23	19.9	27
M8	7.7	10.5	17.7	24	25	34	29	40
M10	15	21	35	48	50	67	59	81
M12	26	36	61	83	86.2	117	103	140
M14	42	58	101	132	136	185	162	220
M16	64	88	147	200	210	285	250	340
M18	89	121	202	275	287	390	346	470
M20	126	171	290	390	405	550	486	660
M22	169	230	390	530	559	745	656	890
M24	217	295	497	375	708	960	840	1140
M27	320	435	733	995	1032	1400	1239	1680
M30	435	590	995	1350	1401	1900	1681	2280
M33	590	800	1349	1830	1902	2580	2278	3090
M36	759	1030	1740	2360	2441	3310	2935	3980
M39	988	1340	2249	3050	3163	4290	3798	5150

Torque Specification Chart						
FOR STANDARD MACHINE HARDWARE (Tolerance ± 20%)						
Hardware Grade	No Marks		SAE Grade 5		SAE Grade 8	
	SAE Grade 2		SAE Grade 5		SAE Grade 8	
Size Of Hardware	in/lbs	Nm.	in/lbs	Nm.	in/lbs	Nm.
	ft/lbs		ft/lbs		ft/lbs	
8-32	19	2.1	30	3.4	41	4.6
8-36	20	2.3	31	3.5	43	4.9
10-24	27	3.1	43	4.9	60	6.8
10-32	31	3.5	49	5.5	68	7.7
1/4-20	66	7.6	8	10.9	12	16.3
1/4-28	76	8.6	10	13.6	14	19.0
5/16-18	11	15.0	17	23.1	25	34.0
5/16-24	12	16.3	19	25.8	29	34.0
3/8-16	20	27.2	30	40.8	45	61.2
3/8-24	23	31.3	35	47.6	50	68.0
7/16-14	30	40.8	50	68.0	70	95.2
7/16-20	35	47.6	55	74.8	80	108.8
1/2-13	50	68.0	75	102.0	110	149.6
1/2-20	55	74.8	90	122.4	120	163.2
9/16-12	65	88.4	110	149.6	150	204.0
9/16-18	75	102.0	120	163.2	170	231.2
5/8-11	90	122.4	150	204.0	220	299.2
5/8-18	100	136	180	244.8	240	326.4
3/4-10	160	217.6	260	353.6	386	525.0
3/4-16	180	244.8	300	408.0	420	571.2
7/8-9	140	190.4	400	544.0	600	816.0
7/8-14	155	210.8	440	598.4	660	897.6
1-8	220	299.2	580	788.8	900	1,244.0
1-12	240	326.4	640	870.4	1,000	1,360.0

The guides and ruler furnished below are designed to help you select the appropriate hardware.

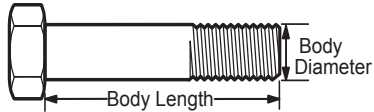


Nut, M8

Thread Diameter (mm)

Inside Diameter (in)      Threads per inch

Nut, 1/2-16



Screw, M8- 1.25 x 25

Thread Diameter (mm)      Distance between threads (mm)      Body Length (mm)

Body Diameter      Threads per inch      Body Length (in)

Screw, 1/2- 16 x 2



## Standard Hardware Sizing

When a washer or nut is identified as 1/2" (M8), this is the *Nominal size*, meaning the *inside diameter* is 1/2 inch (8mm metric thread diameter); if a second number is present it represents the *threads per inch* (distance between threads).

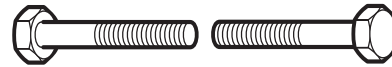
When bolt or capscrew is identified as 1/2 - 16 x 2" (M8 - 1.25 x 50), this means the *Nominal size*, or body diameter is 1/2 inch (8mm metric thread diameter), the second number, 16, represents the *threads per inch*, (*distance between threads*). The final number is the body length of the bolt or screw, 2 inches (50mm).

## NOTES

- These torque values are to be used for all hardware excluding: locknuts, self-tapping screws, thread forming screws, sheet metal screws and socket head setscrews.
- Recommended seating torque values for locknuts:
  - for prevailing torque locknuts - use 65% of grade 5 torques.
  - for flange whizlock nuts and screws - use 135% of grade 5 torques.
- Unless otherwise noted on assembly drawings, all torque values must meet this specification.

## Common Hardware Types

Hex Head Capscrew



Washer



Carriage Bolt



Hex Nut

## Wrench & Fastener Size Guide

1/4" Bolt or Nut Wrench—7/16"	5/16" Bolt or Nut Wrench—1/2"	3/8" Bolt or Nut Wrench—9/16"	7/16" Bolt or Nut Wrench (Bolt)—5/8" Wrench (Nut)—11/16"	1/2" Bolt or Nut Wrench—3/4"
M6 Bolt or Nut Wrench—10mm	M8 Bolt or Nut Wrench—13mm	M10 Bolt or Nut Wrench—17mm	M12 Bolt or Nut Wrench—19mm	M14 Bolt or Nut Wrench—22mm

