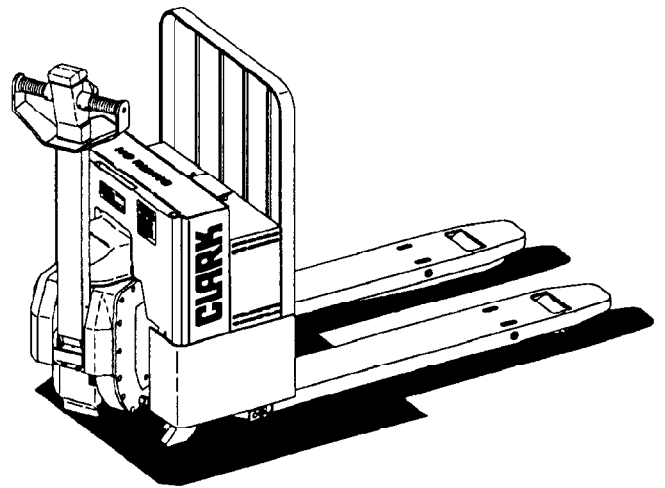

Service Manual

SM 611



WP 40

CLARK

Technical
Publications
Lexington, KY
40507-1640

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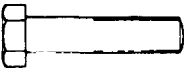



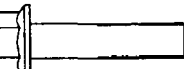

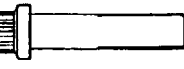

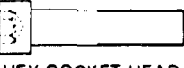




STRENGTH IDENTIFICATION

The most common property classes for metric fasteners are 8.8 and 10.9. The property class is marked with a number on the head of the capscrew or on a nut. Property classes less than 8.8 are often not marked. Grades for inch bolts go from 2 to 8. Grade 2 fasteners normally do not have marks. The following tables show the marks that identify the grades and property classes for different fasteners.

⚠ WARNING When fasteners must be replaced, the new fasteners must be of the same strength or greater than the original fasteners. The new fasteners must also be the correct size.






























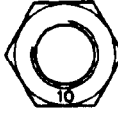















NOTE: IDENTIFICATION MARKS ARE ACCORDING TO BOLT STRENGTH. THE HIGHER THE NUMBER OR THE INCREASE IN THE NUMBER OF MARKS INDICATES INCREASED BOLT STRENGTH.

TABLE 1 - BOLTS AND SCREWS

TYPE OF FASTENER	INCH FASTENERS. STRENGTH LEVELS: SAE GRADES	METRIC FASTENERS. STRENGTH LEVELS: PROPERTY CLASSES
	* MARKINGS NOT REQUIRED	* MARKINGS NOT REQUIRED
 HEX HEAD BOLTS & CAPSCREWS	2 5 5.2 7 8 	4.6* 4.8* 5.8* 8.8  9.8 10.9 12.9 MARKINGS FOR SIZE M5 AND LARGER 
 HEX HEAD FLANGE SCREWS	5 8 	SAME AS ABOVE
 12-POINT FLANGE SCREWS	5 8 	
 HEX SOCKET HEAD CAPSCREWS	MARKINGS NOT REQUIRED	8.8 12.9 
 SEMS	5.1 	4.8* 9.8 

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TABLE 2 - STUDS AND NUTS

TYPE OF FASTENER	INCH FASTENERS. STRENGTH LEVELS: SAE GRADES * MARKINGS NOT REQUIRED	METRIC FASTENERS. STRENGTH LEVELS: PROPERTY CLASSES * MARKINGS NOT REQUIRED
 STUDS	<p>5* 5.2*</p>   <p>8* 8.1</p>  	<p>4.6* 4.8* 5.8* 8.8</p>     <p>9.8 10.9 12.9</p>    <p>MARKINGS FOR SIZE M5 AND LARGER</p> <p>OR</p>     <p>OPTIONAL GEOMETRIC SYMBOLS FOR SIZES M5 THRU M11 ONLY.</p>
 HEX NUTS	<p>2 5 8</p>    <p>OR</p>   	<p>5 8 9</p>    <p>OR</p>    <p>10 12</p>   <p>10 12</p>  
 HEX SLOTTED NUTS	MARKINGS NOT REQUIRED	<p>5 8 9 10 12</p>     
 HEX FLANGE NUTS	MARKINGS NOT REQUIRED	<p>5 8 9 10 12</p>     

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TABLE 3 - TORQUE NUTS





















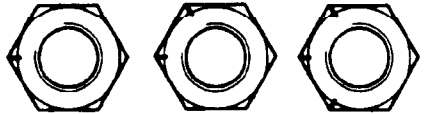




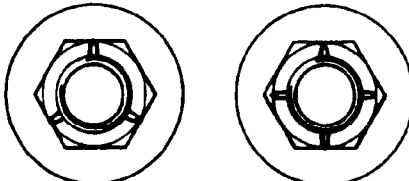
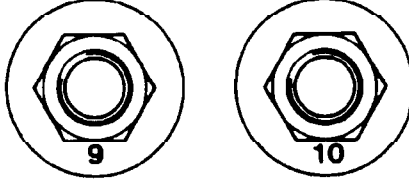
TYPE OF FASTENER	INCH FASTENERS. STRENGTH LEVELS: SAE GRADES	METRIC FASTENERS. STRENGTH LEVELS: PROPERTY CLASSES
 ALL METAL PRE-VAILING-TORQUE NUTS	<div style="display: flex; justify-content: space-around;"> <div>A </div> <div>B </div> <div>C </div> </div> OR <div style="display: flex; justify-content: space-around;">    </div>	<div style="display: flex; justify-content: space-around;"> <div>5 </div> <div>9 </div> <div>10 </div> </div>
 ALL METAL PRE-VAILING-TORQUE FLANGE NUTS	<div style="display: flex; justify-content: space-around;"> <div>F </div> <div>G </div> </div> OR <div style="display: flex; justify-content: space-around;">   </div> OR <div style="display: flex; justify-content: space-around;">   </div>	<div style="display: flex; justify-content: space-around;"> <div>9 </div> <div>10 </div> </div>

TABLE 4 - TORQUE NUTS WITH NYLON INSERT

TYPE OF FASTENER	INCH FASTENERS. STRENGTH LEVELS: SAE GRADES	METRIC FASTENERS. STRENGTH LEVELS: PROPERTY CLASSES
 NYLON INSERT PRE-VAILING-TORQUE NUTS	MARKINGS NOT REQUIRED	<div> <div>5 9 10</div>  <div>OR</div>  <div>OR</div>  <div>OR</div>  </div>
 NYLON INSERT PRE-VAILING-TORQUE FLANGE NUTS	MARKINGS NOT REQUIRED	<div> <div>9 10</div>  <div>OR</div>  </div>

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TABLE 5
CONVERSION TABLE FOR METRIC AND ENGLISH UNITS

AREA					
MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
inches ²	6.452	centimeters ² (cm ²)	centimeters ²	0.155	inches ² (in ²)
feet ²	0.093	meters ² (m ²)	meters ²	10.764	feet ² (ft ²)

LINEAR

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
inches	25.4	millimeters (mm)	millimeter	0.039	inches (in)
feet	0.305	meters (m)	meter	3.281	feet (ft)
yards	0.914	meters (m)	meter	1.094	yards (yd)
miles	1.609	kilometers (km)	kilometer	0.621	miles (mi)

MASS

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
ounces (oz)	28.35	grams (g)	grams	0.035	ounces (oz)
pounds (lb)	0.454	kilograms (kg)	kilograms	2.205	pounds (lb)
tons (2000 lb)	907.18	kilograms (kg)	kilograms	0.001	tons (2000 lb)
tons (2000 lb)	0.907	metric ton (t)	metric ton	1.102	tons (2000 lb)

POWER

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
horsepower	0.746	kilowatts (kW)	kilowatts	1.34	horsepower (hp)

PRESSURE

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
pounds/in ²	6.895	kilopascal (kPa)	kilopascals	0.145	pounds/in ² (psi)
pounds/in ²	0.007	megapascal (MPa)	megapascals	145.04	pounds/in ² (psi)

TEMPERATURE

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
(° Fahrenheit - 32)	0.56	° Celsius (C)	(° Celsius x 1.8)	+ 32	° Fahrenheit (F)

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TORQUE

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
pound inches	0.113	Newton meter (N.m)	Newton meter	8.851	pound inches (lbf in)
pound feet	1.356	Newton meter (N.m)	Newton meter	0.738	pound feet (lbf in)

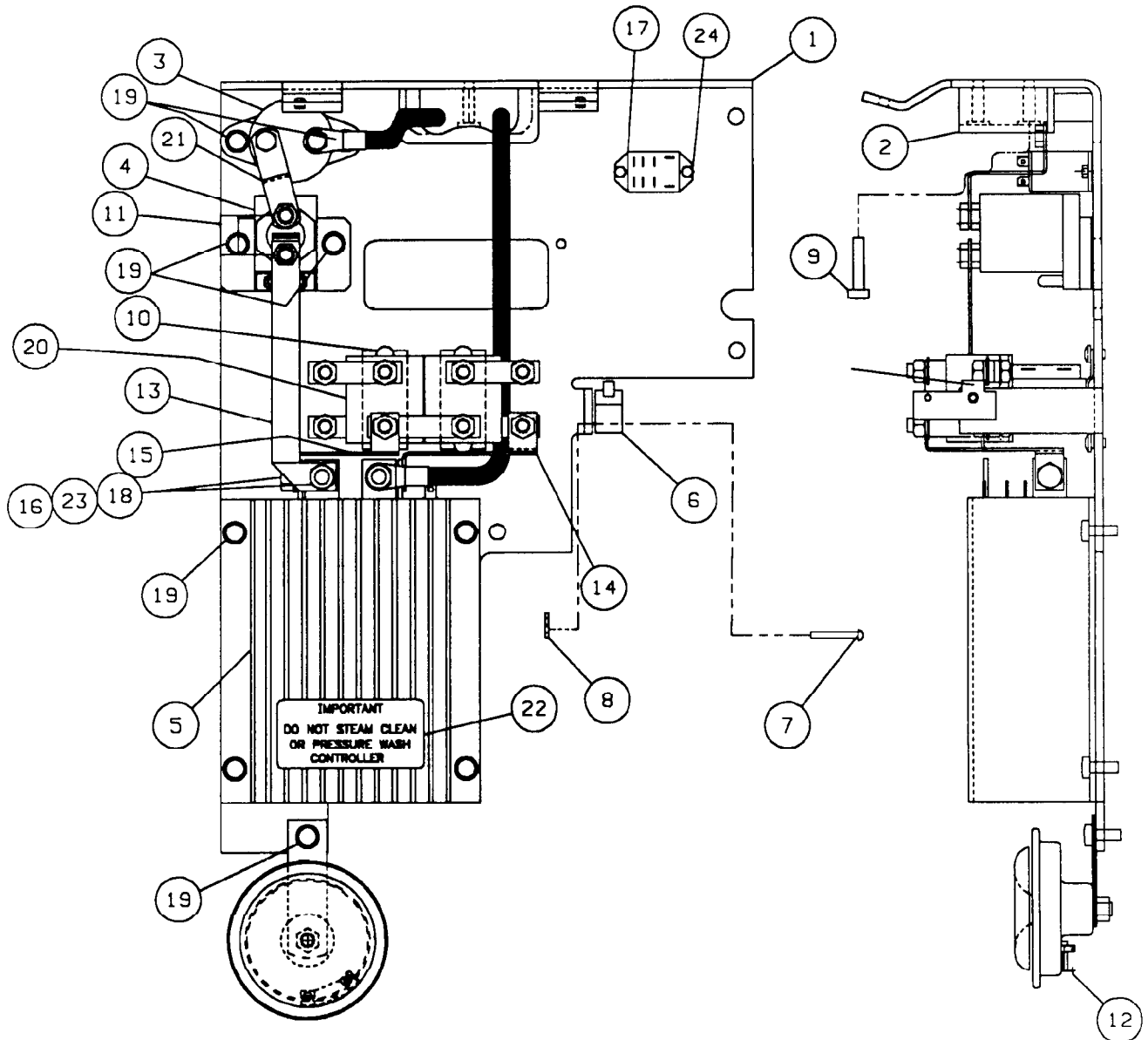
VELOCITY

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
miles/hour	1.609	kilometer/hour (km/h)	kilometer/hour	0.621	miles/hour (mph)

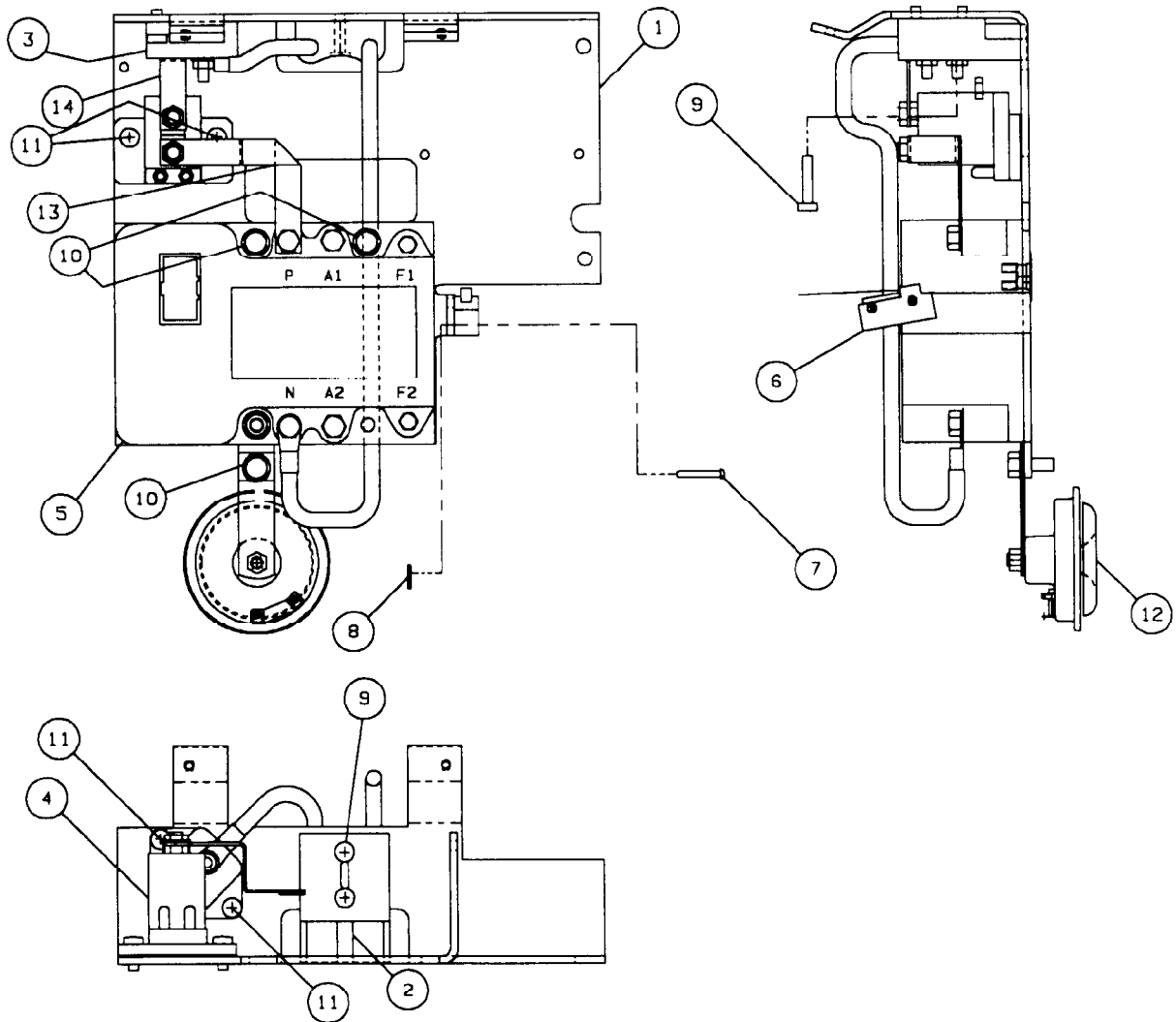
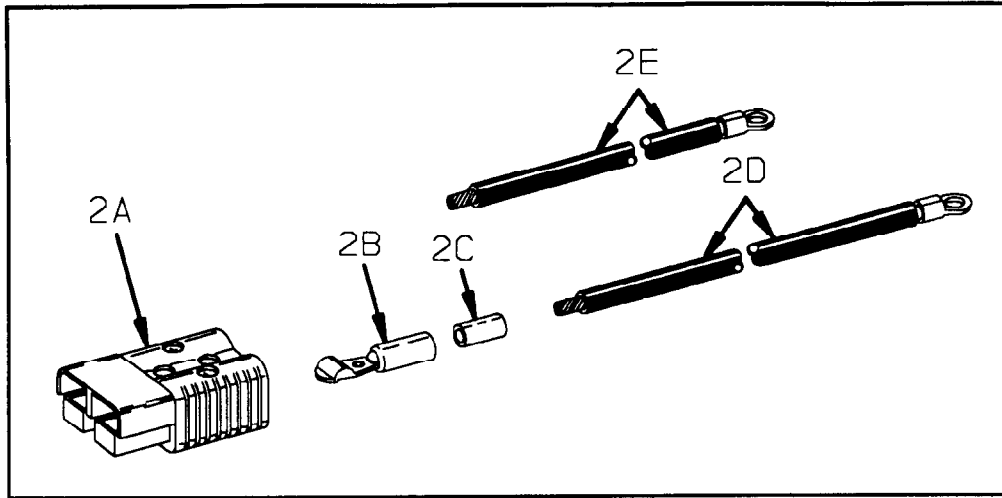
VOLUME

MULTIPLY	BY	TO GET	MULTIPLY	BY	TO GET
inches ³	16.387	centimeters ³ (cm ³)	centimeters ³	0.061	inches ³ (in ³)
inches ³	0.016	liters	liters	61.024	inches ³ (in ³)
quarts, U.S.	0.946	liters	liters	1.057	quarts, U.S. (qt)
quarts, U.S.	0.83	quarts, Imp. (qt)	quarts, Imp.	1.205	quarts, U.S. (qt)
gallons, U.S.	3.785	liters	liters	0.264	gallons, U.S. (gal)
gallons, U.S.	0.83	gallons, Imp. (gal)	gallons, Imp.	1.205	gallons, U.S. (gal)
ounces	29.57	milliliters (ml)	milliliters	0.034	ounces (oz)

12 VOLT PANEL ASSEMBLY (921070 for Lot 8173, 921658 for Lot 8186 and above)



24 VOLT PANEL ASSEMBLY (921071)



NOT ALL ITEMS SHOWN-THIS VIEW