MODEL NMG-118-T4

OPERATION, SERVICE AND PARTS MANUAL

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MANUFACTURED BY KLINGE CORPORATION

REVISION RECORD

Rev	Description	Date	Approved
A	Updated fuel consumption pg 5	6-28-2024	BES
B	Updated cover image and service parts	8-20-2024	BES
C	Added EPA statement, Sect 1.1; corrected Power Supply value, Sect 1.9	4-30-2025	BES

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Service Request

Requests for Service should be directed to the Klinge Service Team. The below link should be used to place all requests for service and will afford the quickest response time.

https://klingecorp.com/request-service/

This form will help us determine model and age of the equipment, location, basic details about the issue, who to contact and how to best handle the issues with the equipment. A service ticket number will be provided in a response email once the form is received and processed. If the equipment is out of warranty, charges may apply for extensive technical support.

Additionally, our Service Department can be reached via email at technical@klingecorp.com.

Spare Parts Request

Requests for Spare Parts should be directed to our Parts Department via email at spares@klingecorp.com. Please have available at the time of the request the Serial Number of the equipment to ensure that the proper part is provided.

Use of this Manual

The use of this manual is intended for the safe operation of the equipment described. It is therefore reasoned that persons who have the occasion to use this manual have a knowledge of mechanical and electrical systems and components addressed by its' contents. However, efforts have been made to enable persons less familiar with these systems to use this manual.

The equipment may be installed in a number of configurations. Each may have optional items and differing external details provided by third parties. The specific electrical diagram is posted on the unit as decals.

Suggestions as to improvement in content and format are welcome and should be addressed to engineering@klingecorp.com. Corrections and improvements will be included on dated revisions – the latest of which will be available upon request.

SECTION 1 SPECIFICATIONS

1.1 GENERAL

The NMG-118-T4 (Nose Mount Generator Set) was specifically designed to meet the rigorous demands of ocean, over-the-road, and rail transport of 20' and 40' refrigerated containers. The NMG-118 can be mounted quickly in the nose of a container, using only four bolts.

The genset meets the EPA T4 regulations as confirmed via extensive testing by the engine manufacturer, Isuzu.

1.2 CONSTRUCTION

Welded aluminum frame
Aluminum doors and closures
Stainless steel hardware

1.3 ENGINE

ISUZU 4LE2 Tier 4/Stage 3B
Liquid cooled diesel, four cylinder; 2.2L; 4 stroke; OHV; direct injected; turbocharged; glow plug assisted Start.
30 kW (40.2 BHP) @ 1800 RPM rated output

1.4 ALTERNATOR

28.4 kW / 35.5 kVA RFL, specifically designed for starting 3 phase AC electrical motors.
Single bearing, 10 lead, 1800 RPM, Y 480 volts, 0.8 power factor lagging.
NOTE: The output voltage is not adjustable but is directly related to the engine's speed. Normal readings at 1800 RPM (60 Hz) are between 460 and 500 V.

1.5 TEMPERATURE OPERATING RANGE

From -30°C to +50°C (-20°F to +125°F)

1.6 WEIGHT

- 500 kg (1100 lbs.) without fuel
- 685 kg (1510 lbs.) with full fuel tank

1.7 MOUNTING

Mounting clip in back, 4 bolts in front

1.8 FUEL SUPPLY

The generator set has an incorporated fuel tank with a capacity of 170 L (45 US gallons) that can provide approximately 22 hours of operation under full load.

1.9 POWER SUPPLY

STANDARD: 28 kVA - 460 V AC / 3 phase / 60 Hz
40 A power circuit breaker
CEE 17 - 32 A power receptacle

1.10 CONTROLS

- Two toggle switches
  - Start switch: OFF-ON-START
  - Engine speed switch: 1000 RPM-1800 RPM
- Isuzu Power View monitors:
  - ENG RPM
  - OIL PRESS
  - COOL TEMP
  - BAT VOLT
  - ENG TORQ
  - MACH HRS
  - FUEL TEMP
  - FUEL RATE
  - INT MFLD T
  - BOOST PRESS
  - SYS VOLT
  - BOST PRES2

1.11 ELECTRICAL STARTING SYSTEM

- Battery: 12V, Group 31 – 950 CCA @ 0°F
- Battery Charging Alternator: 20 or 35 A, 14 VDC
- Starter Motor: 2.0 kW, 12V Gear Reduction type
- Glow plug assisted start with control resistor

1.12 FUEL SYSTEM

- Pre-Fuel Filter w/Water Sedimenter, paper element type w/drain, remote mount
- Pre-Pump, electrical 12 V fuel supply pump, remote mount
- Main Fuel Filter w/Water Sedimenter paper element type with priming pump, w/drain, remote mount
- Engine integrated fuel pump
- Direct injection cylinders

1.13 LUBRICATION SYSTEM

- Full pressure system with trochoid type Oil Pump, driven from the crankshaft.
- Oil pan made out pressed stamped steel, full sump, with a capacity of 8.4 liter (8.9 U.S. quarts).
- Full flow, spin-on Oil Filter, replaceable paper element type.

1.14 COOLING SYSTEM

- Pressurized liquid (50/50 water / glycol mixture) forced circulation by Centrifugal Pump.
- Thermostat, wax pellet type, opening at76.5°C (170°F).
- Cooling fan suction type, plastic 6 blades, 400mm (15.75”) diameter
- Heavy duty 4 row, 3 pass copper / brass Radiator.
- High coolant temperature switch, normal open, single pole, closing at105°C (221°F).

1.15 COMBUSTION AIR CLEANING SYSTEM

- One high performance single stage Cyclopac® air filter with extended life dry cartridge and automatic dust and water expelling Vacuator™ Valve.
- Air cleaner restriction indicator for maximum filter life.

SECTION 2 SAFETY PRECAUTIONS

Safety Glasses should be worn at all times when operating or servicing the Generator Set.

2.1 ROTATING HAZARDS

1. Keep your hands, clothing, and tools clear of the alternator belt when the generator set is running.

2. If it is necessary to run the generator with a removed cover, be very careful with tools or meters being used in that area to avoid contacting the rotor.

2.2 BATTERY HAZARDS

Few people realize just how dangerous a battery can be.

The electrolyte in a lead acid battery is dilute sulfuric acid (H_2SO_4). During charge or discharge functions of a battery, a chemical change takes place within the individual cells that cause the bubbling we see through the filler hole. This gas bubbling is hydrogen and oxygen, and it is **EXPLOSIVE**. If during this gassing action, a means of ignition is present, an explosion could occur. A defective battery may suddenly explode even while standing idle. Added to this danger, consider a fall-out of highly corrosive sulfuric acid caused by the explosion.

PRECAUTIONS

1. Always wear eye protection when servicing batteries. If electrolyte is splashed on the skin or in the eyes, flush immediately under running water. Obtain medical help as soon as possible.
2. When charging batteries, do not remove the vent caps.
3. When disconnecting or reconnecting the generator set battery make sure the ON/OFF switch is in the **OFF** position to prevent an arc, which could cause the battery to explode. Disconnect the ground cable first, preferably at a point away from the battery. Reconnect the ground cable last, again away from the battery if possible.
4. **DO NOT** check a battery by "**sparking**" across the posts. Eye injury from the arc or explosion may occur.

2.3 NOISE HAZARD

When servicing or operating the Generator Set in a running condition, personal protective hearing equipment should be worn when exposure is longer than 8 hours.

2.4 ELECTRICAL HAZARDS

HIGH VOLTAGE

When servicing or repairing a generator set, the possibility of serious or even fatal injury from electrical shock exists. Extreme care must be used when working with an operating generator. Lethal voltage potentials can exist on connections that are in the exciter control box.

Special attention should be given to the Main Power Plug and Receptacle when disconnecting from each other. When disconnecting these two items ensure that the power circuit breaker has been turned to the off position. Do not pull at the cable but rather with a firm grip on the housing,

grab the plug and receptacle and pull apart. If the cable is used rather than the housing the risk exists that the wires within the housing could become dislodged and lead to a future electrical hazard.

PRECAUTIONS

1. When working on high voltage circuits on the generator sets, **DO NOT** make any rapid moves. If a tool drops, **DO NOT** grab for it. People do not contact high voltage wires on purpose. It occurs from an unplanned movement.

2. Make sure of your footing. If you slip, you will instinctively grab for support. This can be lethal around a generator set. Work on rubber mats or dry wood if possible.

3. Use tools with insulated handles that are in good condition. Never hold metal tools in your hand if exposed energized conductors are within reach.

4. Treat all wires and connections as high voltage until a meter and wiring diagram show otherwise.

IMMEDIATE ACTION must be initiated after a person has received an electrical shock. Obtain expert medical assistance if available.
Immediately remove the source of shock by either shutting it down or removing the victim from the source. If it is not possible to shut off the generator set, the wire should be cut with an insulated tool (e.g. a wooden handled axe or cable cutters with heavy insulated handles), or a rescuer wearing insulated gloves. Whichever method is used, **DO NOT** look at the wire while it is being cut. The ensuing flash can cause blindness. Remember that insulated gloves **MUST BE** insulated and not just rubber gloves manufactured for protection from liquids. If the victim has to be removed from live circuitry, pull him off with a non-conductible material. Use his coat, a rope, a piece of dry wood or loop your belt around his leg or arm and pull him off. **DO NOT TOUCH THE PERSON**, you could receive a shock from current flowing through his body. After separating the victim from the power source, check immediately for respiration and presence of pulse. If a pulse is present, respiration might be restored by mouth-to-mouth resuscitation.

LOW VOLTAGE

Control circuits utilized by the generator set are low voltage (12 VDC). This voltage potential is not considered dangerous, but the large amount of current available (over 300 amps) can cause severe burns if shorted to ground.
1. Disconnect the negative terminal of the battery if possible when working on the generator set. Disconnect the cable end that is away from the battery.
2. **DO NOT** wear jewelry, watches, or rings. These items can short out and cause severe burns to the wearer.

2.5 GENERAL SAFETY PRECAUTIONS

1. To prevent against a possible personnel burn injury the following precautions should be followed:
    a. Do not touch the muffler, exhaust pipe or exhaust manifold while the unit is in operation or immediately after stopping the unit. The unit should be allowed to cool to an acceptable level prior to performing service in these areas.
    b. Do not touch the radiator cap or attempt to add coolant to the engine while the unit

is in operation or immediately after stopping the unit. The unit should be allowed to cool to an acceptable level prior to opening the radiator cap.

2. Use extreme caution if holes are drilled into the generator set. Holes drilled into an electrical wire can cause fire, explosion, or shock hazard.
3. Ensure all mounting screws are tight and are the correct length.
4. Keep tools and equipment clean and in good working condition. Accidents occur when you attempt procedures without the proper tools.

2.6 SAFETY DO'S AND DON'TS

DON'T -

DON'T allow inexperienced personnel to work on the generator or electrical equipment.

DON'T remove guards or protective devices.

DON'T wear loose clothing or jewelry in the vicinity of moving parts. These can get in machinery, with disastrous results.

DON'T wear jewelry while working on electrical equipment. If your hair is long, wear a head covering. Hair caught in a drill press, fan belt or other moving part can cause serious injury.

DON'T stand on a wet floor while working on electrical equipment. Use rubber insulated mats placed on dry wood platforms.

DON'T lunge after a dropped tool. To do so may place you in a position of extreme danger.

DON'T commence any operation until you have taken all the necessary steps to ensure that you are in complete safety.

DO -

DO perform your tasks carefully, without undue haste.

DO provide fire extinguishers (rated ABC).

DO provide a First Aid Kit (for burns and abrasions). Obtain medical attention, if necessary.

DO use the correct tools for the job you are doing.

DO make sure that all fasteners are secure.

DO use extreme care while making adjustments on the generator set while it is running.

DO keep your hands away from moving parts.

DO remember - Horseplay is for horses! It has no place around machinery.

DO disconnect batteries before starting work on the generator set.

DO use screwdrivers, pliers, diagonal pliers, etc. with insulated handles.

DO remember to keep one hand in your pocket if it is necessary to work on "**live**" circuits. To do so will prevent passage of electricity into one hand and out the other, which passes current across the heart.

DO PRACTICE SAFETY. THE LIFE YOU SAVE MIGHT BE YOUR OWN

SECTION 3 GENERATOR SET OPERATION

3.1 PRE-START INSPECTION

1. Check fuel level - Use Diesel fuel SAE No. 2-D, No. 1-D in cold weather, or any other equivalent low sulphur content diesel fuel as DIN EN 590; BS 2869 Class A-1; JIS No.2; NATO Code F-54 / F-34 / F-44 and XF-63.
2. Check engine oil level – should be at full mark
   Use SAE multi-grade oil 10W-40 API rating CC/CD or higher for normal operation and SAE 5W-20 when operating at temperatures below -4ºF (-20ºC).
3. Check coolant level – should be between the two marks on the overflow bottle.
4. Check fan belt for tension and integrity.
5. Make sure that the generator's main circuit breaker located in the window of the genset left-hand door is in "OFF" position (right).
6. Ensure the refrigeration unit plug is connected to the generator set power receptacle.

3.2 STARTING THE UNIT

1. Ensure the Engine Speed Switch is set to 1000 RPM.
2. Move the OFF-ON START switch to ON, when the PREHEAT LED goes out (will not illuminate in warmer ambient conditions) toggle the switch to START. Release the switch when the engine has started.
3. Allow the engine to run for a minimum of 10 seconds to become stable at 1000 RPM.
4. Change engine speed switch to 1800 RPM.

3.3 AFTER START CHECK-UP

Look for the following in the Power View window:

- ENG RPM = 1800 ±5
- BAT VOLT = 12.8 VDC or greater
- OIL PRESS = 2 BAR or higher

When the above conditions are met it is safe to switch the main circuit breaker to ON.

There are several safety devices employed to prevent damage to the engine, or the electrical system, should a potentially dangerous situation occur.
The 25 A circuit breaker protects DC components and wiring from a short circuit situation. The circuit breaker will reset periodically until the short circuit is removed.
WHEN A DC CIRCUIT BREAKER IS REPLACED IT MUST BE INSTALLED PROPERLY WITH THE "BAT" TERMINAL CONNECTED TO THE LINE OR BATTERY SIDE OF THE CIRCUIT AND THE "AUX" TERMINAL CONNECTED TO THE LOAD SIDE OF THE CIRCUIT AS INDICATED ON THE CIRCUIT BREAKER.

Two safety shutdown devices are used to protect the engine. One is the high temperature switch that actuates at 221°F (105°C). The other is an oil pressure switch that actuates at 14 psi (1kg/cm^2).

3.4 SHUTTING OFF THE ENGINE

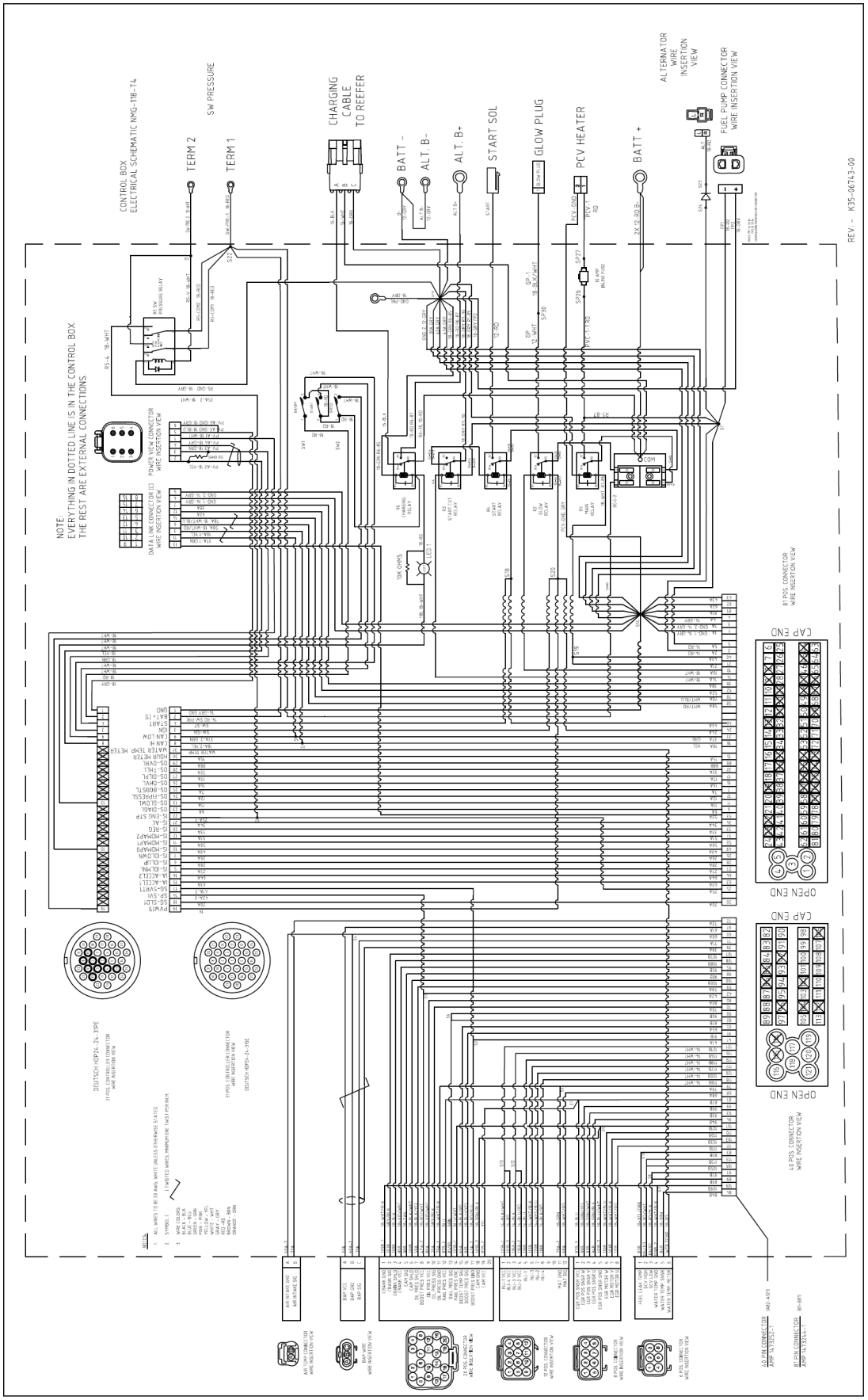
Switch the engine speed to 1000 RPM and allow to run for 3 minutes before switching the start switch to OFF. This will give time for the turbo to cool, extending the life of the turbo/engine.

3.5 LED INDICATORS

The electrical control system is provided with a high intensity red LED located on the upper front of the control box.
This red LED indicates when it is safe to start the engine, based on the temperature following the system's use of glow plugs in low ambient temperature conditions.

3.6 ENGINE SPEED (RPM)

The engine must be set to run at 1000 RPM at start-up.
After allowing the engine to run for 10 seconds to warm up the turbo, the engine speed switch is to be set to 1800 RPM before a load is put on genset.


CONTROL BOX
ELECTRICAL SCHEMATIC NMG-118-T4
TERM 2
TERM 1
SW PRESSURE
CHARGING CABLE TO REEFER
BATT -
ALT B-
ALT B+
START SOL
GLOW PLUG
PCV HEATER
BATT +
ALTERNATOR WIRE INSERTION VIEW
FUEL PUMP CONNECTOR WIRE INSERTION VIEW
NOTE
EVERYTHING IN DOTTED LINE IS IN THE CONTROL BOX
THE REST ARE EXTERNAL CONNECTIONS
REV - K35-06743-00
CAP END
OPEN END
CAP END
OPEN END

SECTION 4 MAINTENANCE AND COMPONENT INFORMATION

4.1 FUEL SYSTEM

The fuel injection pumps and fuel injection nozzles are precisely manufactured and therefore using fuel which contains water or dust particles will result in equipment seizure, costly damages and decreased engine output.
Replace fuel filter element after every 500 hrs of operation.
Use KLINGE K26-25310-08 pre-filter element and K26-25310-09 main filter element.
Before starting the unit check for leaks and for water in the filter bowl. Drain if necessary.
Use SAE No.2-D Diesel fuel, 1-D in cold weather.
The following standards are also approved: DIN EN 590; BS 2869 Class A-1; JIS No.2; NATO Code F-54 / F-34 / F-44 and XF-63.
DO NOT USE:

- Diesel fuel that has been contaminated with engine oil, this can cause engine damage and can also affect emission control.
- Fuel additives, except "Biocide" type, if required.

4.2 COMBUSTION AIR INTAKE SYSTEM

Engine performance and life depends on the intake air condition.
Replace air filter cartridge after every 500 hours of operation.
Use KLINGE K26 25091 08 filter cartridge.
After 100 hours of operation, or more often if the generator set is operated in a dusty environment, remove the filter cartridge and blow air at a pressure of 3 – 6 BAR (45 –70 PSI) only from the inside, to remove the dust.
Take care to not damage the filter element during the cleaning and to not cause air leakage (sucking) when the air cleaner is reassembled.

4.3 LUBRICATION

A correct oil and filter service will ensure good performance and a long engine life.
Change oil and filter after initial 50 hours of operation.
Afterwards change the oil every 250 hours and filter every 500 hours of operation or at least once in a year.
Use SAE multi-grade oil SAE 10W-40 API rating Cj-4 or higher and SAE 5W-20 when operating at temperatures below -20°C (-4°F).
Use KLINGE XB-998209 filter element.
Check the oil level before every start, add oil if required, up to the FULL mark.
CAUTION: Never mix up different brand or different type of oils.

4.4 COOLING SYSTEM

Use 50/50 Ethylene Glycol / Water solution. Never exceed 60 / 40 antifreeze water mix.
NOTE: Concentrations over 65% Ethylene Glycol adversely affect freeze protection, heat transfer rates and silicate stability that may cause water pump leakage.
Replace coolant every two years.
Check the hoses and pump for leaks and the coolant level, before every trip of the unit. With a cool engine the liquid level should be between the two marks on the expansion tank.

4.5 FAN BELT

Check the fan belt for tension and integrity before every start.
Replace if necessary, using KLINGE K26 25310-20 belt.

4.6 BATTERY

Keep the battery fully charged all the time, it is important especially in cold seasons.
Keep the battery posts clean and the battery cables tightened securely.
Always disconnect the battery negative cable when work on the unit is performed.
If distillated water is needed to be added, do it before the unit will be operated, otherwise the water will not mix with the acid and can freeze in cold weather.

4.7 STARTER AND BATTERY CHARGING ALTERNATOR

The starter and the battery charging alternator servicing consists of:

- Check the carbon brushes and the brush contact.
- Clean the alternator slip ring.

Avoid spraying water or steam on the alternator and on the starter, it may cause damage.

4.8 SERVICING SCHEDULE

	Daily or Weekly	Initial 50 Hours	Every 250 Hours	Every 500 Hours	Every 1000 Hours	Every 2000 Hours
GENERATOR SET (NMG-118)						
Check Fuel Level / add if needed	X					
Check sediment bowl on fuel filter (Drain water and clean if needed)		X	X			
Replace Fuel Filter				X		
Replace Air Filter Insert (More frequent may be required based on operating area)				X		
Check Oil Level / add if needed	X					
Replace Oil Filer		X		X (Min Yearly)		
Replace Oil		X	X (Min Yearly)			
Check for fluid leaks	X	X				
Check radiator coolant level/ add if needed	X					
Inspect and if needed clean radiator fins			X			
Flush radiator and replace coolant and hoses						X
Inspect and adjust cooling fan V-belt		X	X			
Replace V-belt						X
Inspect and clean Vacuator valve (Air Filter)			X			
Check engine for unusual noises or exhaust smoke	X		X			
Ensure battery terminals are tight			X			
Check main circuit breaker plastic boot			X			
Inspect unit and generator set for damaged, loose, or broken parts, missing bolts			X			
Check condition of mounting bolts		X	X			
Check condition of engine and alternator mounts (replace if necessary)		X			X	

- In addition to the above checklist the normal Pre-Trip Inspection Form should also be completed every 2 months.

4.9 PTI FORM

It is important that a Pre-Trip Inspection (PTI) be completed prior to each shipment.

The NMG-118-T4 PTI form can be found on Klinge's website at:
http://www.klingecorp.com/pti/

SECTION 5 TROUBLESHOOTING

5.1 TROUBLE SHOOTING

The following trouble shooting chart is by no means complete, but covers the more general type problems, which would most likely occur if a breakdown is experienced.

POSSIBLE CAUSE	CORRECTIVE ACTION SUGGESTED
Problem: Engine starter will not energize	
Loose or corroded battery terminals	Clean terminals and tighten
Battery voltage too low	Recharge or replace battery
Faulty START / PREHEAT switch	Replace
Faulty ON / OFF switch	Replace
Faulty starter solenoid	Replace
Faulty starter motor	Replace
Circuit breaker open	Replace if it does not reset
Problem: Starter turns but engine does not ignite	
Faulty control relay R1	Replace
Faulty emergency stop timer	Replace
Faulty engine fuel solenoid	Replace
Control rack is stuck in stop position	Remedy
Engine too hot and protection system will not allow to operate	Allow engine to cool
Faulty coolant temperature switch	Replace switch
Faulty electrical fuel pump	Replace
No fuel	Add fuel to tank
Clogged fuel filter element	Replace

POSSIBLE CAUSE	CORRECTIVE ACTION SUGGESTED
Problem: Engine starts but stalls immediately	
Air in the fuel system	Remedy and bleed the system
Defective oil pressure switch Low oil pressure LED stays ON	Replace switch
Oil level to low	Add oil
Problem: Engine stops with high engine temperature indication	
Coolant temperature too high	Check cooler for air flow restriction and clean or remove restriction
Coolant level too low	Add coolant
Defective high temperature switch	Replace switch
Thermostat malfunction	Replace
Fan belt slippage or broken	Remedy or replace
Problem: Black exhaust	
Clogged air filter	Clean the filter cartridge or replace
Improper fuel – low cetane grade	Replace fuel
Nozzle damage	Repair or replace nozzle
Problem: White smoke	
Water mixed in fuel	Replace fuel and clean fuel filter
Low compression pressure	Check compression
Low coolant temperature	Check thermostat and replace if needed
Problem: Unstable engine running (Hunting)	
Defective governor spring	Replace
Incorrect valve adjustment	Adjust valve clearance

POSSIBLE CAUSE	CORRECTIVE ACTION SUGGESTED
Problem: No voltage at power receptacle but AC voltmeter needle is in the green band	
Main circuit breaker is on OFF position	Turn main circuit breaker ON
Defective main circuit breaker	Replace
Problem: No AC voltage	
No residual magnetism in the alternator exciter field	Restore magnetism by flashing field
Open in main stator windings	Check for continuity in windings
* Open or short in rotating diodes	Check rotating diodes and replace if needed
* Open in alternator field	Check for continuity. If field coils are open, replace the rotor or repair it.
* Shorted exciter armature	Check for short and replace if faulty. Use a Kelvin type bridge to measure this resistance
* Shorted leads between exciter armature and generator field	Test and repair
NOTE: * Designated rotating parts. The rear alternator cover (bearing carrier) must be removed in order to perform the test. For instructions how to perform the tests see “ALTERNATOR MANUAL” at the end of this Manual.	
Problem: Low voltage	
Low speed	Check engine speed or system for overload.
Excess load	Reduce load. The load on each leg should be as evenly balanced as possible and should not exceed the rated current on any leg.
High resistance connections – Connections will be warm or hot	Make better connections, electrically and mechanically.
Shorted field	Test field coils for possible short. Use an Ohmmeter or resistance bridge. Repair or replace rotor if alternator field coils are shorted.

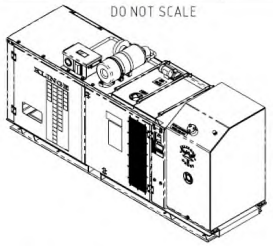
POSSIBLE CAUSE	CORRECTIVE ACTION SUGGESTED
Problem: Fluctuating voltage	
Irregular engine speed	Check engine for malfunction.
Loose terminal or load connections	Make better connections.
Defective bearing causing uneven gap	Replace alternator bearing.
Problem: Overheating	
Generator overloaded	Reduce load. Check with ammeter and compare with alternator nameplate rating.
Unbalanced load	The load on each leg should be as evenly balanced as possible and should not exceed the rated current on each leg.
Dry bearing	Replace bearing
Clogged vent ducts	Clean air passages

SECTION 6 SERVICE PARTS

LIST OF CONTENTS

DRAWING NO. 460-18902-00

DO NOT SCALE



REV	DATE	DESCRIPTION	CHANGE NO	DRAWN	APPROVED
D	20230417	ITEM #40 QTY WAS 45 (INCHES), ITEM #41 WAS XB-999057 QTY 8, ITEM #47 QTY WAS 36, ITEM #48 QTY WAS 14, ITEM #53 QTY WAS 61, ITEM #56 QTY WAS 20, ITEM #62 QTY WAS 9, ITEM 66 QTY WAS 11, ITEM #67 QTY WAS 11, ITEM #68 QTY WAS 36, ITEM #75 WAS K21-50227-90, ITEM #84 QTY WAS 6, ITEM #85 QTY WAS 11, ITEM #94 WAS K26-25091-02, ADDED ITEM #104, ITEM #105 WAS K21-16218-00, ITEM #106 WAS K21-18426-02 QTY 1, ADDED ITEMS #110 SHEET 5, ADDED #111 SHEET 3, ADDED SECTION BD-BD DETAIL SHEET 3, ADDED "AIR INTAKE TEMPERATURE SENSOR" AND AIR FLOW AT "PVC HEATER" SHEET 5, UPDATED FUEL LINES	22-063	DBG	BES
E	20230612	ITEM #56 QTY WAS 9, ITEM #60 QTY WAS 15, ITEM #73 QTY WAS 1, ITEM #74 QTY WAS 15, ITEM #85 QTY WAS 4, ITEM #103 QTY WAS 12, ADDED ITEMS #112 THRU #118, ADDED NOTE #2, UPDATED FUEL LINE HOSE LENGTHS SHEET 7	23-167	DBG	BES
F	20240111	REMOVED ITEM #108 (360-18978-00), ITEM #109 WAS K21-15649-04 SHEET 7	23-191	DBG	BES

ITEM NO	PART NO	DESCRIPTION	QTY	ITEM NO	PART NO	DESCRIPTION	QTY	ITEM NO	PART NO	DESCRIPTION	QTY
118	K21-16548-09	CLAMP CS VINYL COATED 0.812" ID 3/4" WIDE	2	80	K21-16547-10	WASHER, FLAT, STAINLESS STEEL, M10 X 30 X 2.5	12	40	XB-998090	TUBE PVC CLEAR 5/16 I.D. (INCHES)	90
117	K21-15797-04	WASHER LOCK EXT INT SS #10	1	79	K21-16583-10	NUT LOCK SS M10 X 1.5 NYLON INSERT	6	39	060-18893-00	HOSE RADIATOR INLET DAYCO	1
116	K21-16523-03	SCREW HEX SS M5 X 0.80 X 10 LONG 18-8 FULL THREAD	1	78	K21-50226-30	SCREW, HEX, SS, FULL THREAD, M10 X 1.5 X 30	18	38	060-18894-00	HOSE RADIATOR OUTLET NMG TIER 4	1
115	K21-16548-29	CLAMP CS VINYL COATED 1.75" ID 1.00" WIDE	1	77	K21-16547-12	WASHER, FLAT, STAINLESS STEEL, M12 X 37 X 3	8	37	060-14473-00	HOLDER RADIATOR OUTLET HOSE NMG-115-10	1
114	K21-18505-06	WASHER, FLAT, STAINLESS STEEL, M6 X 14.3 X 1.27	1	76	K21-16583-12	NUT LOCK SS M12 X 1.75 NYLON INSERT	4	36	360-14506-02	CABLE BATTERY NEGATIVE BLACK BOOT 41 INCH LG	1
113	K21-50226-20	SCREW HEX SS M10 X 1.5 X 20 LONG 18-8 FULL THREAD	2	75	K21-50227-80	SCREW HEX SS M12 X 1.75 X 80 18-8 PARTIAL THREAD	4	35	360-14506-01	CABLE BATTERY POSITIVE RED BOOT 41 INCH LG	1
112	K21-50421-05	WASHER LOCK SPG SS M5 X 9.2 X 1.2 THK	1	74	K21-50401-10	WASHER, FLAT, STAINLESS STEEL, M10 X 20 X 2	18	34	XB-993011-02	RUBBER PAD - BATTERY 3.0W x 12.0in LG	2
111	K26-25310-03	FUEL LOW PRESSURE PUMP ISUZU NMG TIER-4	1	73	K21-50226-25	SCREW, HEX, SS, FULL THREAD, M10 X 1.5 X 25	2	33	XB-993011-22	RUBBER NEOPRENE 3/16" X 2.0" X 8.5"	1
110	K26-24666-00	INDICATOR AIR RESTRICTION 20" H20	1	72	K21-14072-00	WASHER FLAT STAINLESS STEEL 5/16 X 0.88 X 18-8	2	32	K25-25912-00	BATTERY, 12 VOLT, TOP STUDS WITH NUTS	1
F 109	K21-15649-08	CLAMP CUSH SS 3/4 IN ID .28 MOUNTING HOLE	2	71	060-14493-00	BRACKET SS BATTERY HOLD-DOWN	1	31	360-18911-01	BRACKET FUEL MAIN FILTER PAINTED	1
F 108			1	70	K21-14921-07	NUT, LOCK, STAINLESS STEEL, 5/16 - 18	2	30			1
107	360-18970-00	BOX BREAKER (TOP MOUNT)	1	69	XB-209049	ROD BATTERY HOLD DOWN NMG-115-10	2	29			
106	K23-13427-14	FITTING 90 DEG 3/8 HOSE 14mm BANJO	1	68	K21-50421-08	WASHER, LOCK, SPRING, SS, M8 X 15.4 X 2	40	28	360-18922-00	BOX CONTROL WHITE	1
105	K21-16686-10	CLAMP OETIKER SS DOUBLE PINCH (15-18MM)	8	67	K21-50401-08	WASHER, FLAT, STAINLESS STEEL, M8 X 17 X 1.4-1.8	4	27	XB-993000-18	RUBBER NEOPRENE 1/8" X 1.0" X 4.0"	2
104	K23-07981-00	CLAMP HOSE SS 1.81 TO 2.75 DIA. RANGE	4	66	K21-50225-25	SCREW HEX SS M8 X 1.25 X 25 LONG 18-8 FULL THREAD	15	26	XB-205126	BRACKET ASSEMBLY RADIATOR HOLD-DOWN	1
103	K28-10804-06	HOSE NEOPRENE PUSH LOCK BLACK (QTY IN FT)	9.9	65	K21-16245-00	WASHER FLAT SS #8	1	25	XB-993011-03	RUBBER 3/16 X 3.0 X 9.0	2
102	K29-18490-00	HOOK STRAP SS 0.125 DIA. WIRE	6	64	K21-14921-02	NUT LOCK SS NO 8-32 18-8	1	24	XB-340015	RADIATOR 4 ROW / 3 PASS NMG ISUZU ENG	1
101	K28-10691-00	STRAP 15" LG NO HOOKS	3	63	XB-991434-10	SCR FLAT SS #8-32 X 1-1/4 PHIL 18-8	1	23	360-18855-00	SHROUD FAN ASSEMBLY TIER 4 NMG	1
100	K28-10797-00	GROM .875x1.25x.1875	1	62	K21-50401-06	WASHER, FLAT, STAINLESS STEEL, M6 X 12 X 1.4-1.8	8	22	060-18854-01	POST RADIATOR FRONT PAINTED NMG T4	1
99	K26-25095-04	HOOD AIR INLET PLASTIC STYLE E FITS 2.50 OD FLTER	1	61	K21-16526-30	STUD FLUSH M6 X 1.0 X 30MM LG	2	21	060-18853-01	ANGLE RADIATOR TOP SUPPORT PAINTED	1
98	K28-11155-00	HOSE ADAPTER PCV VENT TUBE	1	60	K21-50421-10	WASHER, LOCK, SPRING, SS, M10 X 18.4 X 2.5	18	20	360-18850-01	POST REAR RADIATOR PAINTED NMG TIER-4	1
97	K28-11154-00	ELBOW 90 DEG 1.50" - 2.00" I.D. SILICONE	1	59	K21-18510-08	WASH INSUL PVC M8 25.4/8.4MM OD/ID 0.02 IN 0.51MM	66	19	360-11014-00	CLIP RETAINING	1
96	K28-11156-00	ELBOW 90 DEG 2.00" - 2.25" I.D.	1	58	K21-50225-30	SCREW HEX SS M8 X 1.25 X 30 18-8 FULL THREAD	39	18	060-18943-01	RETAINER POWER CABLE PAINTED	2
95	K26-24667-00	BAND AIR CLEANER MTG 6.5 ID	2	57	K21-16638-25	SCR FLAT SS M8-1.25 X 25 LG	7	17	060-18849-01	ANGLE DIAGONAL SUPPORT TOP PLATE PAINTED	1
94	K26-25091-00	FILTER AIR 1 STAGE 2-1/2 IN - 2-1/4 OUT	1	56	K21-50421-06	WASHER, LOCK, SPRING, SS, M6 X 12.2 X 1.5	10	16	360-18847-01	POST ASSEMBLY FRAME REAR PAINTED	1
93	360-18925-01	AIR INTAKE ASSEMBLY PAINTED NMG TIER 4	1	55	K21-50224-20	SCREW, HEX, SS, FULL THREAD, M6 X 1.00 X 20	14	15	060-18846-01	POST FRAME REAR PAINTED NMG TIER 4	1
92	K21-16684-00	CLAMP DUAL LINE 5/8" TO 3/4" OD	1	54	K21-18510-06	WASH INSUL PVC M6 19.6/6.2MM OD/ID 0.51MM THICK	31	14	360-18844-01	ANGLE TOP REAR PAINTED NMG TIER-4	1
91	K21-50226-40	SCREW, HEX, SS, FULL THREAD, M10 X 1.5 X 40	2	53	K21-16547-08	WASHER FLAT SS M8 LARGE OD 24MM 18-8 2MM THICK	72	13	360-18842-01	ANGLE TOP FRONT PAINTED NMG TIER-4	1
90	K28-11147-00	FITTING 90-DEG BARB 3/8 HOSE 9/16-18 FEMALE	2	52				12	360-18840-01	PANEL CONTROL ASSEM PAINTED NMG TIER 4	1
89	K21-15649-15	CLAMP CUSH SS 32mm=1.25 ID	1	51	K21-16583-08	NUT LOCK SS M8 X 1.25 NYLON INSERT	22	11	360-18838-00	PANEL ALTERNATOR END WELDED & PAINTED WHITE	1
88	K21-15649-03	CLAMP CUSHIONED STAINLESS STEEL 1/2 INCH	2	50	K21-16231-00	CLAMP HOSE SS 0.75 - 1.50 INCH	2	10	K29-17880-01	HINGE SLIP SS 9/32 HOLES SOCK LT HAND	2
87	K21-10189-00	WASHER FLAT STAINLESS STEEL 1/4 X 0.28 X 0.63	6	49	K21-50224-18	SCREW, HEX, SS, FULL THREAD, M6 X 1.00 X 18	8	9	360-18890-00	PANEL TOP ASSEMBLY	1
86	K21-14642-00	SCREW HEX SS 1/4-20 X 1/2 LG	6	48	K21-16583-06	NUT LOCK SS M6 X 1 NYLON INSERT	17	8	360-18908-00	DOOR ASSEMBLY RIGHT NMG TIER 4	1
85	K21-50103-06	NUT HEX SS M6 X 1	5	47	K21-16547-06	WASHER, FLAT, STAINLESS STEEL, M6 X 18 X 1.6	29	7	360-18888-00	DOOR LEFT END ASSEMBLY NMG TIER-4	1
84	K21-50224-25	SCREW, HEX, SS, FULL THREAD, M6 X 1.00 X 25	2	46	K29-17879-01	HINGE SLIP SS 9/32 HOLES SOCKET	2	6	360-18885-00	PANEL ASSEMBLY REAR NMG TIER-4	1
83	K21-16528-30	BOLT CARR SS M8 x 1.25 x 30	1	45	XB-995029	SLEEVING FIBERGLASS 1.5ID 1000 F	32	5	XB-999076	ISOLATOR ENGINE NEOPRENE 260 LB AXIAL 130 LB LOAD	4
82	060-09113-00	INSULATOR HINGE	4	44	K21-12930-00	CLAMP HOSE SS 1.06" TO 2"	2	4	360-18814-02	CRADLE RFL ALTERNATOR BLACK	1
81	K21-18510-10	WASH INSUL PVC M10 31.8/10.3MM OD/ID 0.02 IN 0.51MM	8	43	360-18895-10	EXHAUST ASSEMBLY PAINTED NMG TIER 4	1	3	360-18892-00	ENGINE ALTERNATOR ASSEMBLY TIER 4	1
				42	K23-10280-00	CLAMP HOSE (.38 - .63) 5/16 WIDE SS	2	2	360-18874-00	TANK ASSEMBLY FUEL NMG-TIER 4	1
				41	K21-18426-02	CLAMP HOSE SS 1.25 TO 2.125 DIA. RANGE	5	1	360-18836-01	FRAME ASSEMBLED WELDED NMG PAINTED	1

NOTES:
1. USE ANTI-SEIZE KLINGE P/N K13-02069-00 ON ALL STAINLESS STEEL FASTENERS
2. SEE WI #157 FOR CONTROL BOX ENGINE HARNESS CONNECTIONS, AND TO SECURE HARNESS

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MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A

DIMENSIONS ARE MM [INCHES]
TOLERANCES (UNLESS OTHERWISE INDICATED)
LINEAR
X. = +/- 1.0 [OR +/- .040]
X.X = +/- 0.5 [+/- .020]
ANGULAR
X. = +/- 2°
X.X = +/- 0.5°

KLINGE

	NAME	DATE
DRAWN	NWB	20221011
APPROVED	BES	20221017

KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA

TITLE: UNIT GENSET NMG-TIER 4 ISUZU ENGINE/RFL ALTERNATOR 18 KW

CAGE/DCCM	DRAWING NO.	REV
0K0L1	460-18902-00	F

SCALE N/A | SHEET 1 OF 9 | SHEET SIZE: A2

460-18902-00

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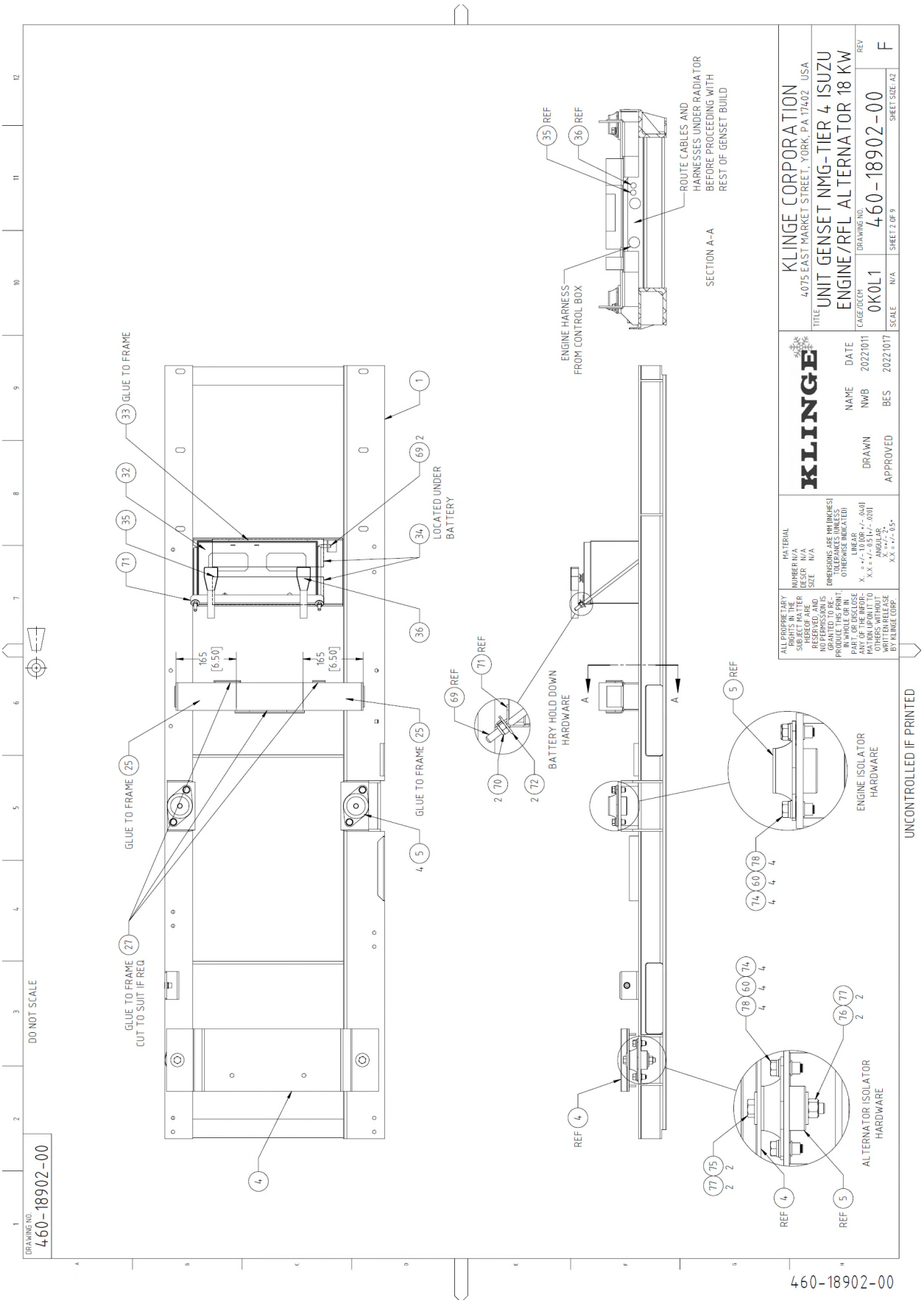
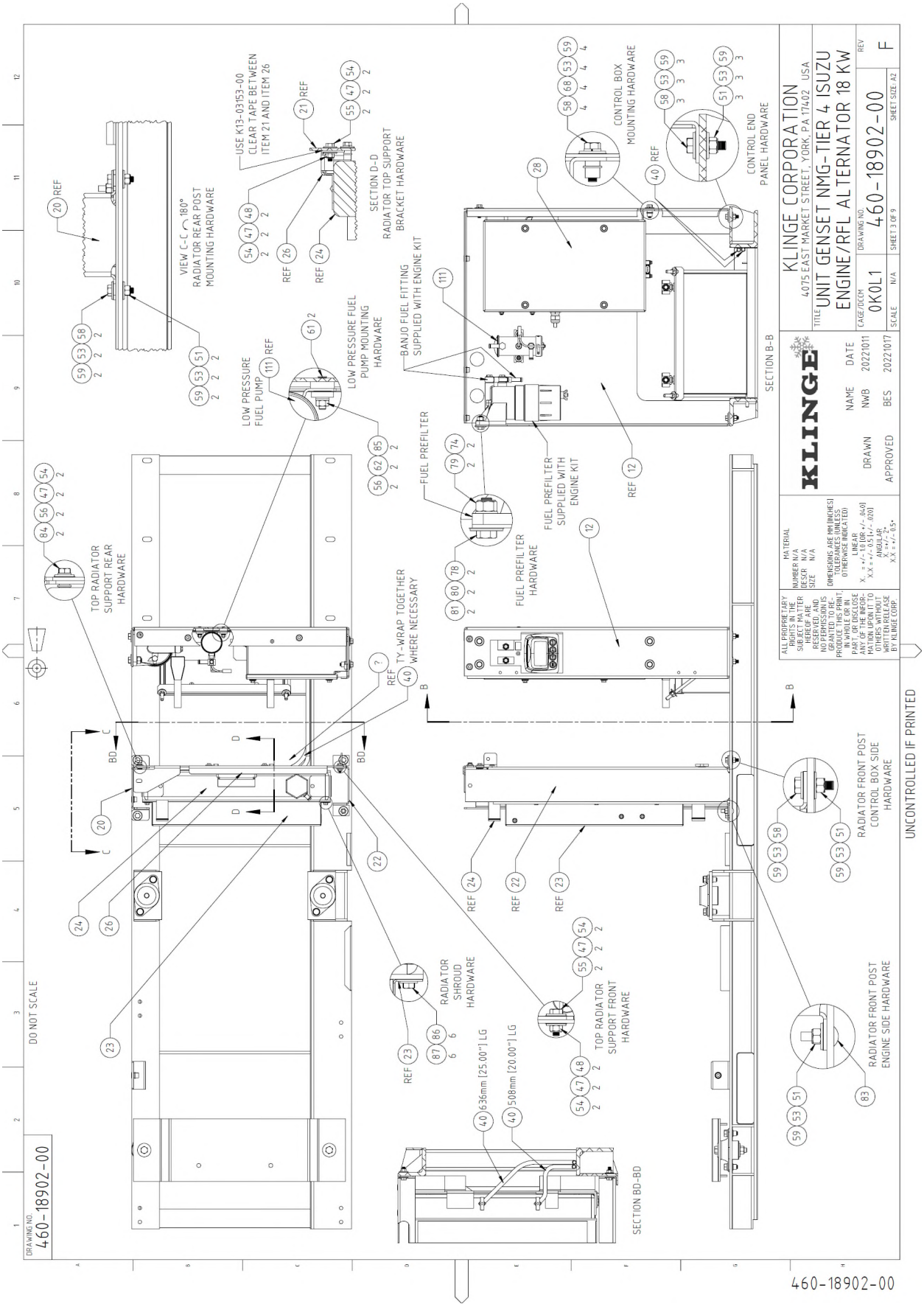

KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
TITLE UNIT GENSET NMG-TIER 4 ISUZU ENGINE/RFL ALTERNATOR 18 KW
CAGE/JDCM 0K0L1
DRAWING NO. 460-18902-00
REV F
SCALE N/A
SHEET 2 OF 9
SHEET SIZE: A2
KLINGE
DRAWN NWB 20221011
APPROVED BES 20221017
DRAWING NO. 460-18902-00
DO NOT SCALE
UNCONTROLLED IF PRINTED
460-18902-00
SECTION A-A
ROUTE CABLES AND HARNESSES UNDER RADIATOR BEFORE PROCEEDING WITH REST OF GENSET BUILD
ENGINE HARNESS FROM CONTROL BOX
LOCATED UNDER BATTERY
GLUE TO FRAME
GLUE TO FRAME CUT TO SUIT IF REQ
BATTERY HOLD DOWN HARDWARE
ENGINE ISOLATOR HARDWARE
ALTERNATOR ISOLATOR HARDWARE
165 [6.50]
165 [6.50]


KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
UNIT GENSET NMG-TIER 4 ISUZU
ENGINE/RFL ALTERNATOR 18 KW
460-18902-00
F
0K0L1
SHEET 3 OF 9
SHEET SIZE: A2
KLINGE
DRAWN NWB 20221011
APPROVED BES 20221017
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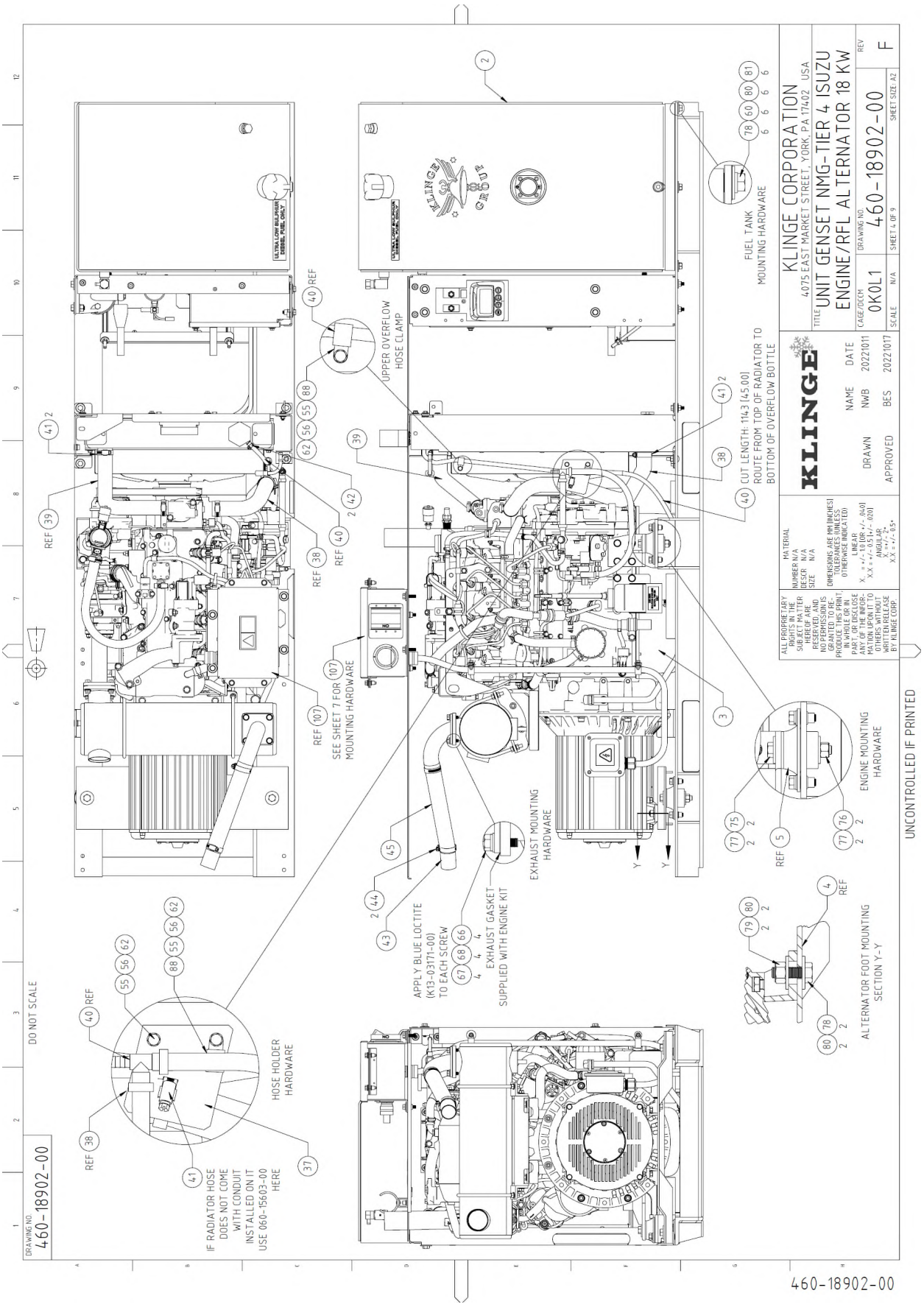
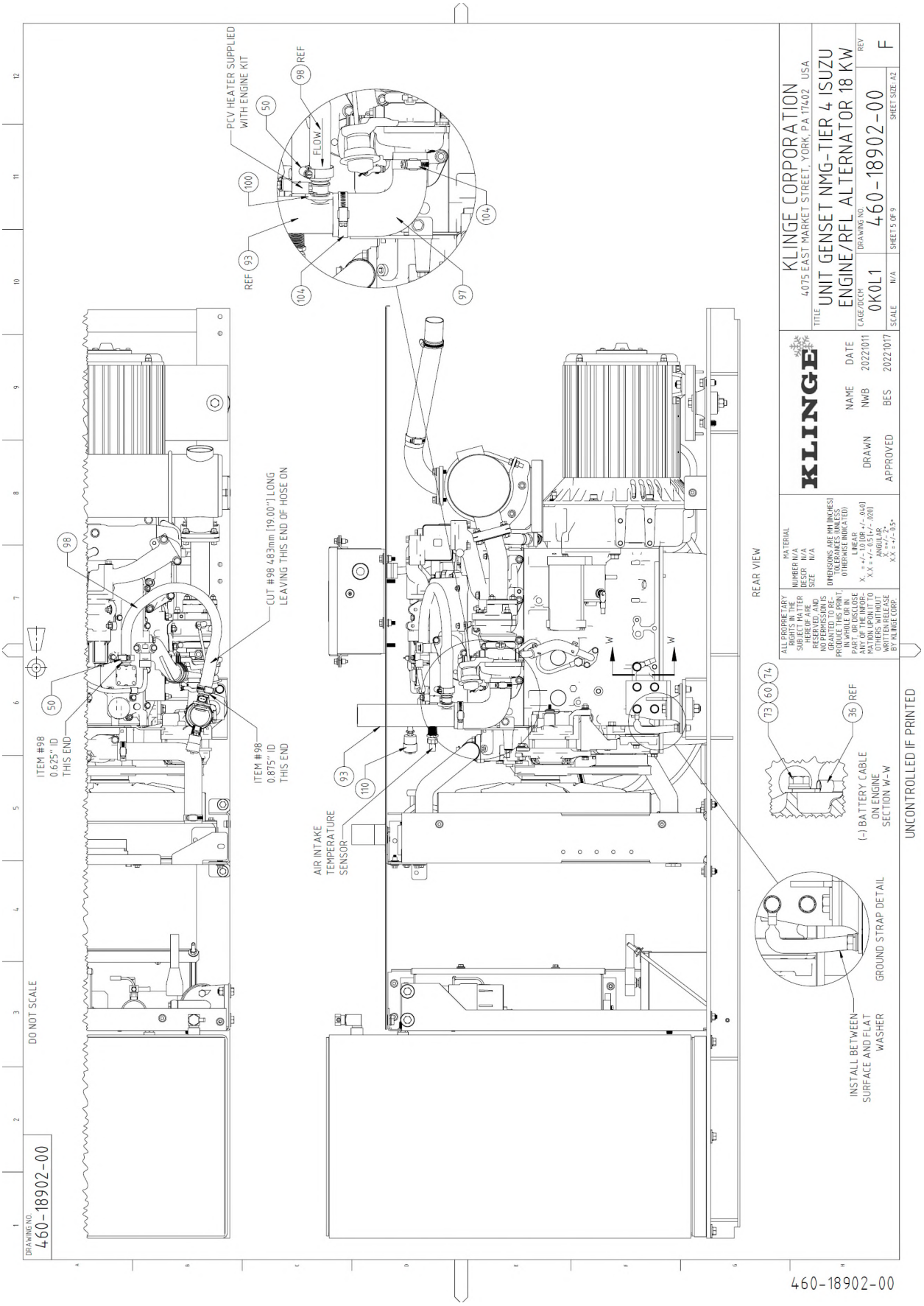
DO NOT SCALE
UNCONTROLLED IF PRINTED
460-18902-00
VIEW C-C 180° RADIATOR REAR POST MOUNTING HARDWARE
USE K13-03153-00 CLEAR TAPE BETWEEN ITEM 21 AND ITEM 26
SECTION D-D RADIATOR TOP SUPPORT BRACKET HARDWARE
CONTROL BOX MOUNTING HARDWARE
CONTROL END PANEL HARDWARE
SECTION B-B
BANJO FUEL FITTING SUPPLIED WITH ENGINE KIT
LOW PRESSURE FUEL PUMP
LOW PRESSURE FUEL PUMP MOUNTING HARDWARE
FUEL PREFILTER
FUEL PREFILTER SUPPLIED WITH ENGINE KIT
FUEL PREFILTER HARDWARE
TOP RADIATOR SUPPORT REAR HARDWARE
TY-WRAP TOGETHER WHERE NECESSARY
RADIATOR SHROUD HARDWARE
TOP RADIATOR SUPPORT FRONT HARDWARE
636mm [25.00"] LG
508mm [20.00"] LG
SECTION BD-BD
RADIATOR FRONT POST CONTROL BOX SIDE HARDWARE
RADIATOR FRONT POST ENGINE SIDE HARDWARE


KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
UNIT GENSET NMG-TIER 4 ISUZU ENGINE/RFL ALTERNATOR 18 KW
460-18902-00
F
UNCONTROLLED IF PRINTED
DO NOT SCALE
460-18902-00
FUEL TANK MOUNTING HARDWARE
UPPER OVERFLOW HOSE CLAMP
CUT LENGTH: 114.3 [4.50] ROUTE FROM TOP OF RADIATOR TO BOTTOM OF OVERFLOW BOTTLE
SEE SHEET 7 FOR MOUNTING HARDWARE
EXHAUST MOUNTING HARDWARE
ENGINE MOUNTING HARDWARE
APPLY BLUE LOCTITE (K13-03171-00) TO EACH SCREW
EXHAUST GASKET SUPPLIED WITH ENGINE KIT
HOSE HOLDER HARDWARE
IF RADIATOR HOSE DOES NOT COME WITH CONDUIT INSTALLED ON IT USE 060-15603-00 HERE
ALTERNATOR FOOT MOUNTING SECTION Y-Y


PCV HEATER SUPPLIED WITH ENGINE KIT
98 REF
50
100
FLOW
104
REF 93
104
97
98
50
ITEM #98
0.625" ID
THIS END
CUT #98 483mm [19.00"] LONG
LEAVING THIS END OF HOSE ON
ITEM #98
0.875" ID
THIS END
93
110
AIR INTAKE
TEMPERATURE
SENSOR
REAR VIEW
W
W
73 60 74
36 REF
(-) BATTERY CABLE
ON ENGINE
SECTION W-W
INSTALL BETWEEN
SURFACE AND FLAT
WASHER
GROUND STRAP DETAIL
DO NOT SCALE
DRAWING NO.
460-18902-00
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
TITLE
UNIT GENSET NMG-TIER 4 ISUZU
ENGINE/RFL ALTERNATOR 18 KW
CAGE/DCN
0K0L1
DRAWING NO.
460-18902-00
REV
F
SCALE
N/A
SHEET 5 OF 9
SHEET SIZE: A2
KLINGE
NAME
DATE
DRAWN
NWB
20221011
APPROVED
BES
20221017
MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A
DIMENSIONS ARE MM [INCHES]
TOLERANCES UNLESS
OTHERWISE INDICATED
LINEAR
X.x = +/- .10 [.XX = +/- .040]
X.xx = +/- .05 [+/- .020]
ANGULAR
X. = +/- 2°
X.X = +/- 0.5°
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NO PERMISSION IS
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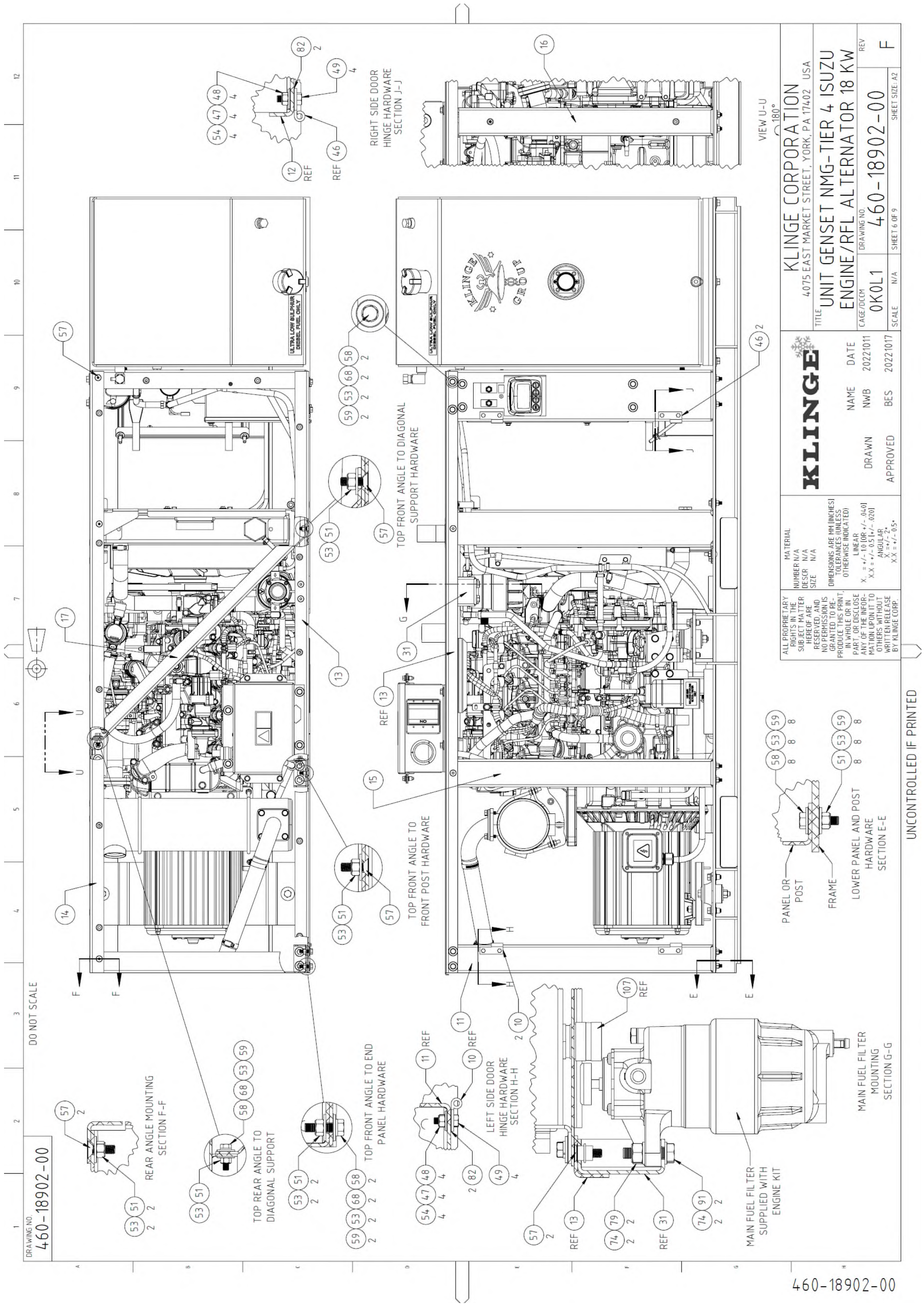
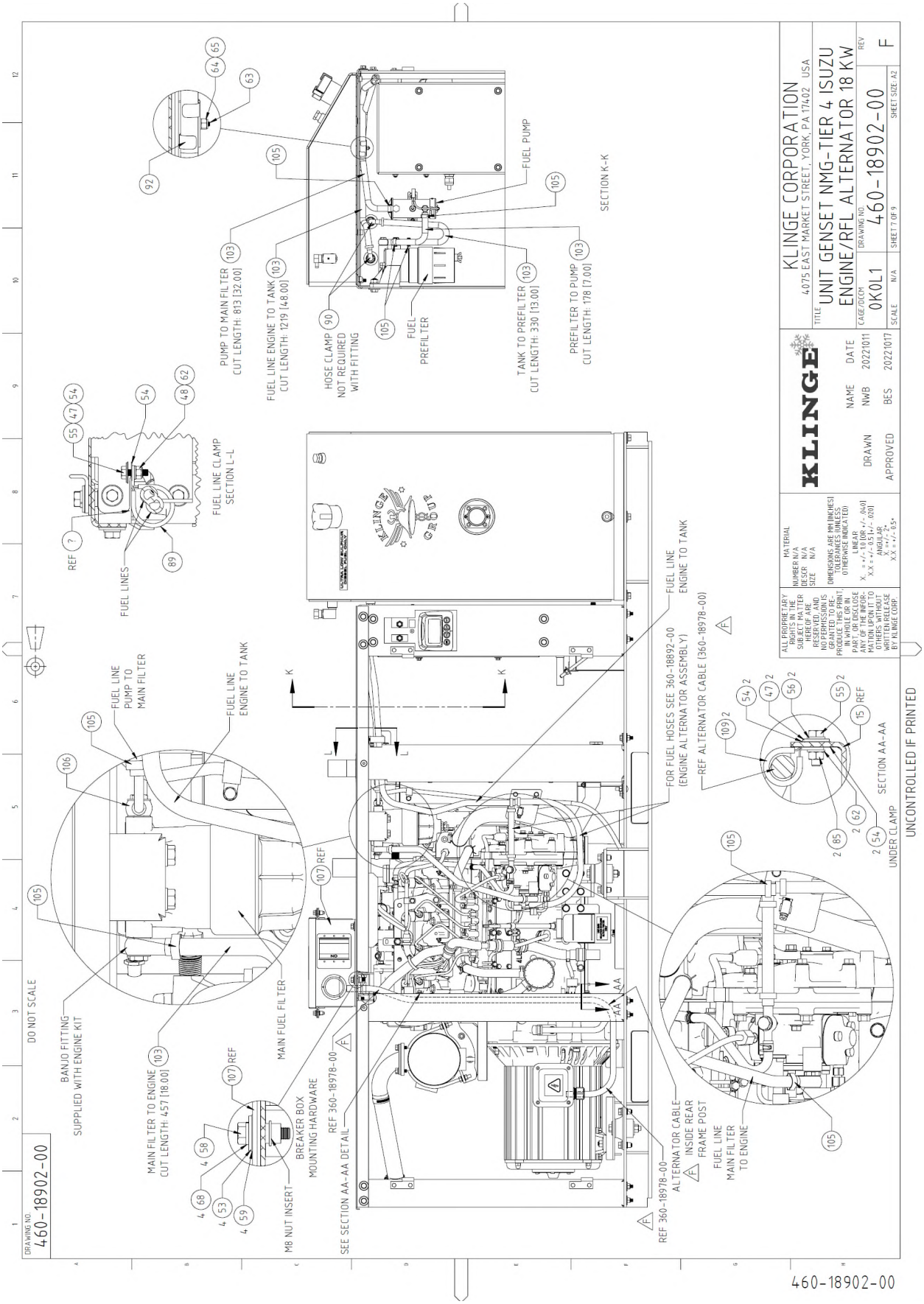
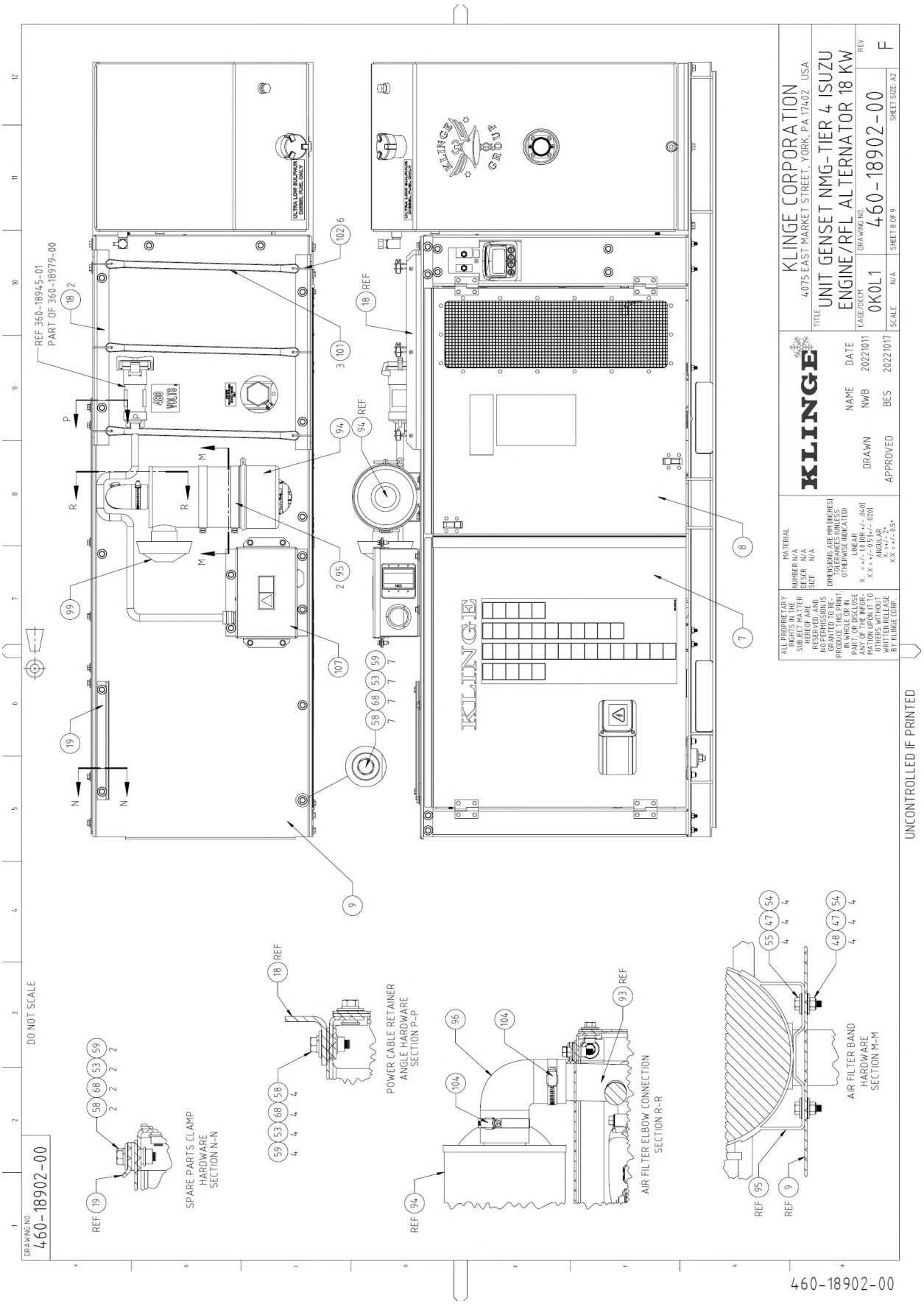
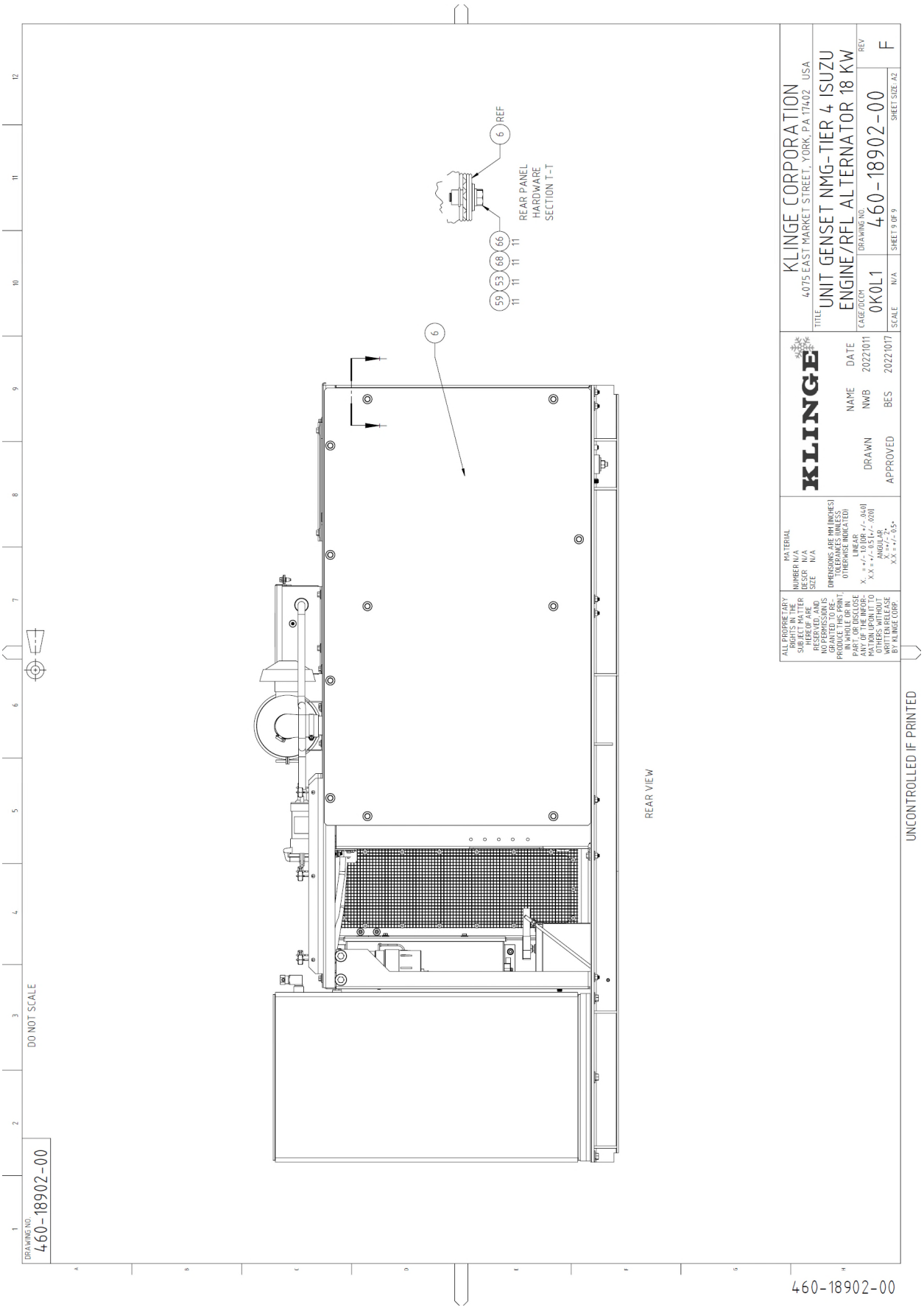
460-18902-00


KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
UNIT GENSET NMG-TIER 4 ISUZU ENGINE/RFL ALTERNATOR 18 KW
460-18902-00
REV F
DO NOT SCALE
UNCONTROLLED IF PRINTED
REAR ANGLE MOUNTING SECTION F-F
TOP REAR ANGLE TO DIAGONAL SUPPORT
TOP FRONT ANGLE TO END PANEL HARDWARE
LEFT SIDE DOOR HINGE HARDWARE SECTION H-H
MAIN FUEL FILTER SUPPLIED WITH ENGINE KIT
MAIN FUEL FILTER MOUNTING SECTION G-G
TOP FRONT ANGLE TO FRONT POST HARDWARE
TOP FRONT ANGLE TO DIAGONAL SUPPORT HARDWARE
RIGHT SIDE DOOR HINGE HARDWARE SECTION J-J
LOWER PANEL AND POST HARDWARE SECTION E-E
PANEL OR POST
FRAME
VIEW U-U 180°
460-18902-00


KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
UNIT GENSET NMG-TIER 4 ISUZU
ENGINE/RFL ALTERNATOR 18 KW
460-18902-00
F
0K0L1
SHEET 7 OF 9
SHEET SIZE: A2
KLINGE
DRAWN NWB 20221011
APPROVED BES 20221017
DO NOT SCALE
UNCONTROLLED IF PRINTED
460-18902-00
FUEL PUMP
PUMP TO MAIN FILTER CUT LENGTH: 813 [32.00]
FUEL LINE ENGINE TO TANK CUT LENGTH: 1219 [48.00]
HOSE CLAMP NOT REQUIRED WITH FITTING
FUEL PREFILTER
TANK TO PREFILTER CUT LENGTH: 330 [13.00]
PREFILTER TO PUMP CUT LENGTH: 178 [7.00]
SECTION K-K
FUEL LINE CLAMP SECTION L-L
FUEL LINES
FUEL LINE PUMP TO MAIN FILTER
FUEL LINE ENGINE TO TANK
BANJO FITTING SUPPLIED WITH ENGINE KIT
MAIN FILTER TO ENGINE CUT LENGTH: 457 [18.00]
MAIN FUEL FILTER
BREAKER BOX MOUNTING HARDWARE
M8 NUT INSERT
SEE SECTION AA-AA DETAIL
FOR FUEL HOSES SEE 360-18892-00 (ENGINE ALTERNATOR ASSEMBLY)
REF ALTERNATOR CABLE (360-18978-00)
ALTERNATOR CABLE INSIDE REAR FRAME POST
FUEL LINE MAIN FILTER TO ENGINE
SECTION AA-AA
UNDER CLAMP


KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
UNIT GENSET NMG-TIER 4 ISUZU
ENGINE/RFL ALTERNATOR 18 KW
460-18902-00
F
UNCONTROLLED IF PRINTED
DO NOT SCALE
SPARE PARTS CLAMP HARDWARE SECTION N-N
POWER CABLE RETAINER ANGLE HARDWARE SECTION P-P
AIR FILTER ELBOW CONNECTION SECTION R-R
AIR FILTER BAND HARDWARE SECTION M-M
REF 360-18945-01 PART OF 360-18979-00
460-18902-00


6 REF
REAR PANEL HARDWARE SECTION T-T
59 53 68 66
11 11 11 11
6
REAR VIEW
DO NOT SCALE
DRAWING NO 460-18902-00
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
TITLE UNIT GENSET NMG-TIER 4 ISUZU ENGINE/RFL ALTERNATOR 18 KW
CAGE/DLCH 0K0L1
DRAWING NO 460-18902-00
REV F
SCALE N/A
SHEET 9 OF 9
SHEET SIZE A2
KLINGE
NAME DATE
DRAWN NWB 20221011
APPROVED BES 20221017
MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A
DIMENSIONS ARE MM UNLESS OTHERWISE INDICATED TOLERANCES UNLESS OTHERWISE INDICATED
LINEAR
X = +/- 1.0 (OR +/- .04)
X.X = +/- 0.5 (+/- .020)
ANGULAR
X = +/- 2°
X.X = +/- 0.5°
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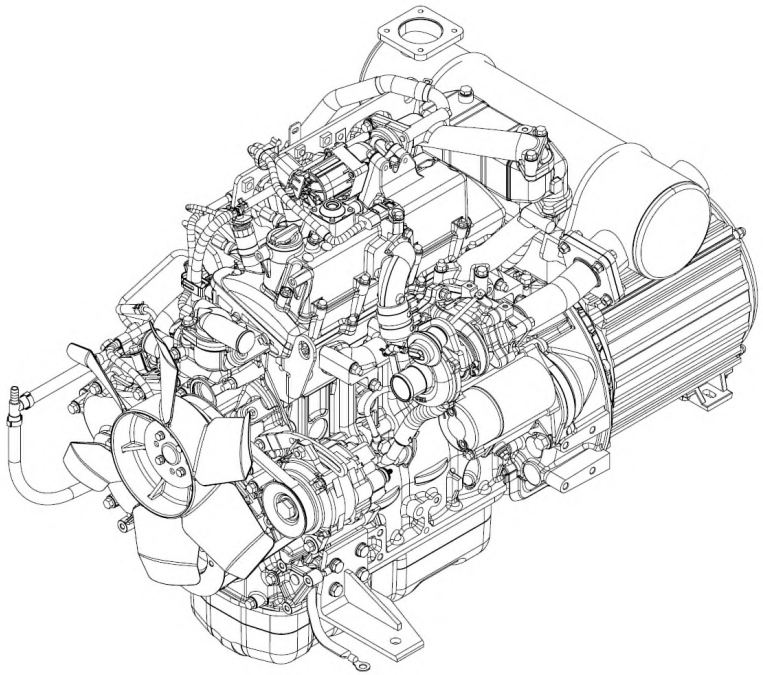
460-18902-00

DRAWING NO. 360-18892-00

DO NOT SCALE

REV	DATE	DESCRIPTION	CHANGE NO	DRAWN	APPROVED
A	10/11/2022	PLACE HOLDER LINE ADDED FOR ITEM 8	22-228	RJK	BES
B	20221024	ITEM 8 (GROUND STRAP) ADDED TO BOM. ITEM 12 (ALTERNATOR) PART NUMBER CHANGED.	22-237	RJK	BES
C	20230405	ITEM #5 WAS K21-16218-00, ITEM #20 WAS #21, ITEM #21 WAS #23, ITEM # 22 WAS #24, ITEM #23 WAS #25, ITEM #24 WAS #26, ITEM #25 WAS #27, ITEM #26 WAS #28, ITEM #27 WAS #29, ITEM #28 WAS #20, ITEM #29 WAS #22, UPDATED FUEL LINE SHEET 6	23-059	DBG	BES
D	20230612	ITEM #3 QTY WAS 2.13 FT, UPDATED ITEM #3 FUEL LINE HOSE LENGTHS SHT 6	23-167	DBG	BES



ITEM NO	PART NO	DESCRIPTION	QTY
29	K21-50224-20	SCREW HEX SS M6 X 1 X 20 FULL__THD	4
28	K21-50401-06	WASHER FLAT SS M6 6.4 X 12 X 1.4-1.8 18.8 DIN 125	4
27	K26-25310-16	BOLT, HEX WITH WASHER, STAINLESS STEEL, M10 X 1.0 X 25	1
26	K26-25310-14	FITTING, BANJO, FUEL LINE, ISUZU	1
25	K26-25310-15	WASHER, FUEL LINE, SEALING, ISUZU	1
24	XB-302169	BRACKET, OIL DRAIN HOSE	1
23	K21-16681-30	SCREW CAP SOCKET ZINC-ALLOY M10 X 1.5 - 30	6
22	XB-992749	WASHER, FLAT, ZINC PLATED, M8	8
21	XB-992659-16	SCREW, HEX, CAP SOCKET, BLACK OXIDE, M8 X 16	8
20	K21-50226-25	SCREW HEX SS M10 X 1.5 X 25 18-8 933 FULL THREAD	3
19	K21-50401-10	WASHER FLAT SS M10 10.5 X 20 X 2 18-8 DIN 125	19
18	K21-50421-10	WASHER, LOCK, SPRING, STAINLESS STEEL, M10 X 18.4 X 2.5	19
17	XB-992610-30	BOLT, HEX, ZINC PLATED, M10 X 30 MM	8
16	XB-999094	CAP, BOTTLE, RADIATOR OVERFLOW	1
15	XB-999093	BOTTLE, COOLANT, OVERFLOW	1
14	XB-152043	DECAL, "50/50 ETHYLENE GLYCOL / WATER"	1
13	360-14381-00	SUPPORT OVERFLOW BOTTLE ASSEMBLY NMG BLACK	1
12	360-18951-00	ALTERNATOR RFL-30 MODIFIED WITH BREAKER BOX	1
11	360-14518-02	HOSE ASSEMBLY OIL DRAIN ISUZU	1
10	K23-13332-07	FITTING, 90 DEGREE, CARBON STEEL, 7/8 INCH	1
9	XB-998200	FAN, COOLING, SUCTION, PLASTIC, 6 BLADE, ISUZU	1
8	K25-26621-08	STRAP GROUND 8" LG 3/8" MOUNTING HOLE	1
7	360-18868-01	MOUNT ENGINE RIGHT TIER 4 PAINTED	1
6	360-18867-01	MOUNT ENGINE LEFT TIER 4 PAINTED	1
5	K21-16686-10	CLAMP OETIKER SS DOUBLE PINCH (15-18MM)	4
4	K28-11150-00	FITTING 3/8 HOSE BARBED TEE CONNECTOR	1
3	K28-10804-06	HOSE, RUBBER, 3/8 INCH ID, PUSH LOCK (QTY IN FT)	1.96
2	K28-10804-04	HOSE, RUBBER, 1/4 INCH ID, PUSH LOCK (QTY IN FT)	0.75
1	K26-25310-00	ENGINE, ISUZU, 4LE2TAGV-07 (MODIFIED)	1

NOTES:
1. USE ANTI-SEIZE KLINGE P/N K13-02069-00 ON ALL STAINLESS STEEL FASTENERS

ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER HEREOF ARE RESERVED, AND NO PERMISSION IS GRANTED TO REPRODUCE THIS PRINT, IN WHOLE OR IN PART, OR DISCLOSE ANY OF THE INFORMATION UPON IT TO OTHERS WITHOUT WRITTEN RELEASE BY KLINGE CORP.

MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A

DIMENSIONS ARE MM [INCHES]
TOLERANCES (UNLESS OTHERWISE INDICATED)
LINEAR
X. = +/- 1.0 [OR +/- .040]
X.X = +/- 0.5 [+/- .020]
ANGULAR
X. =+/- 2°
X.X = +/- 0.5°

KLINGE

	NAME	DATE
DRAWN	AUV	20220429
APPROVED	BES	20220919

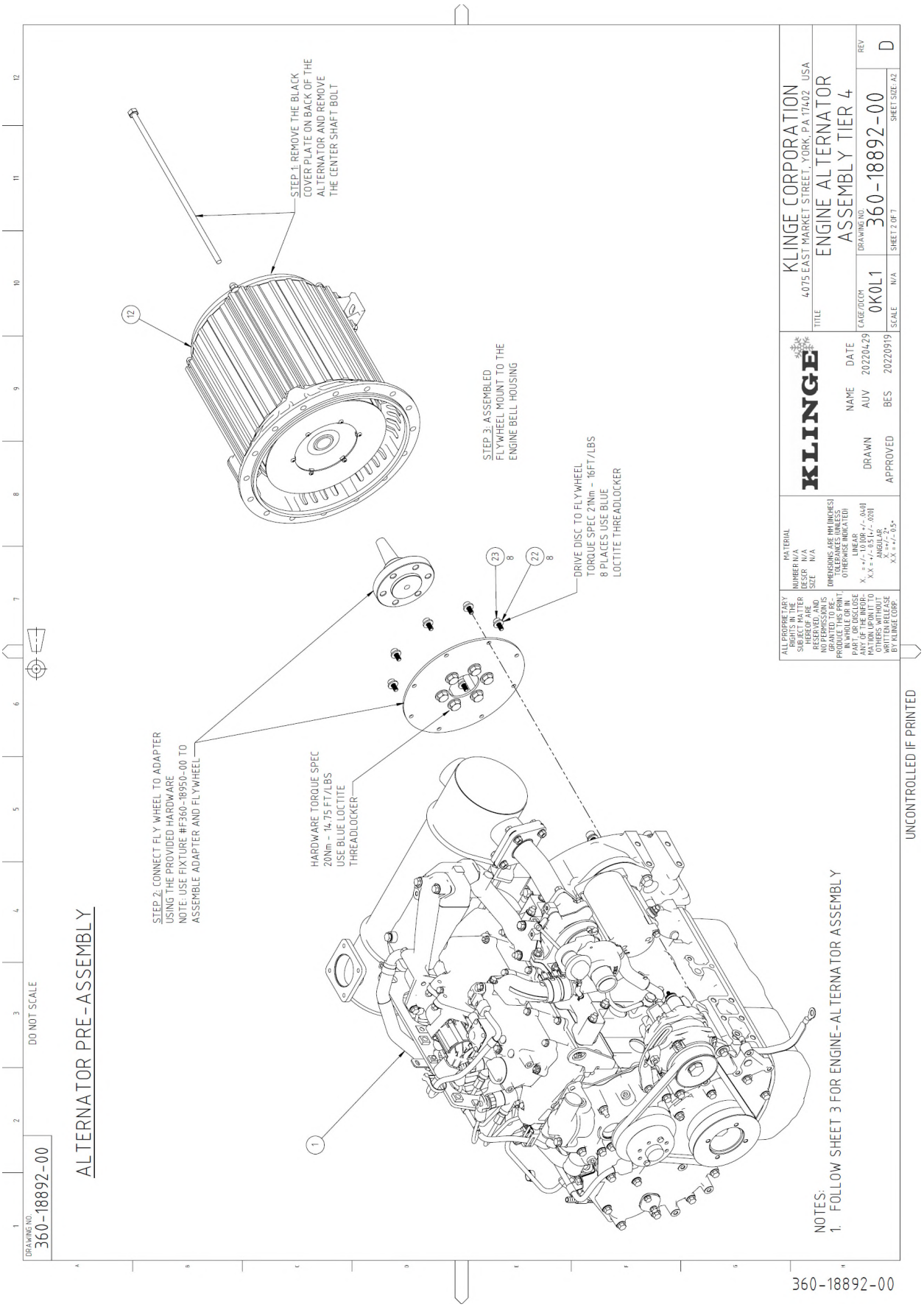
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA

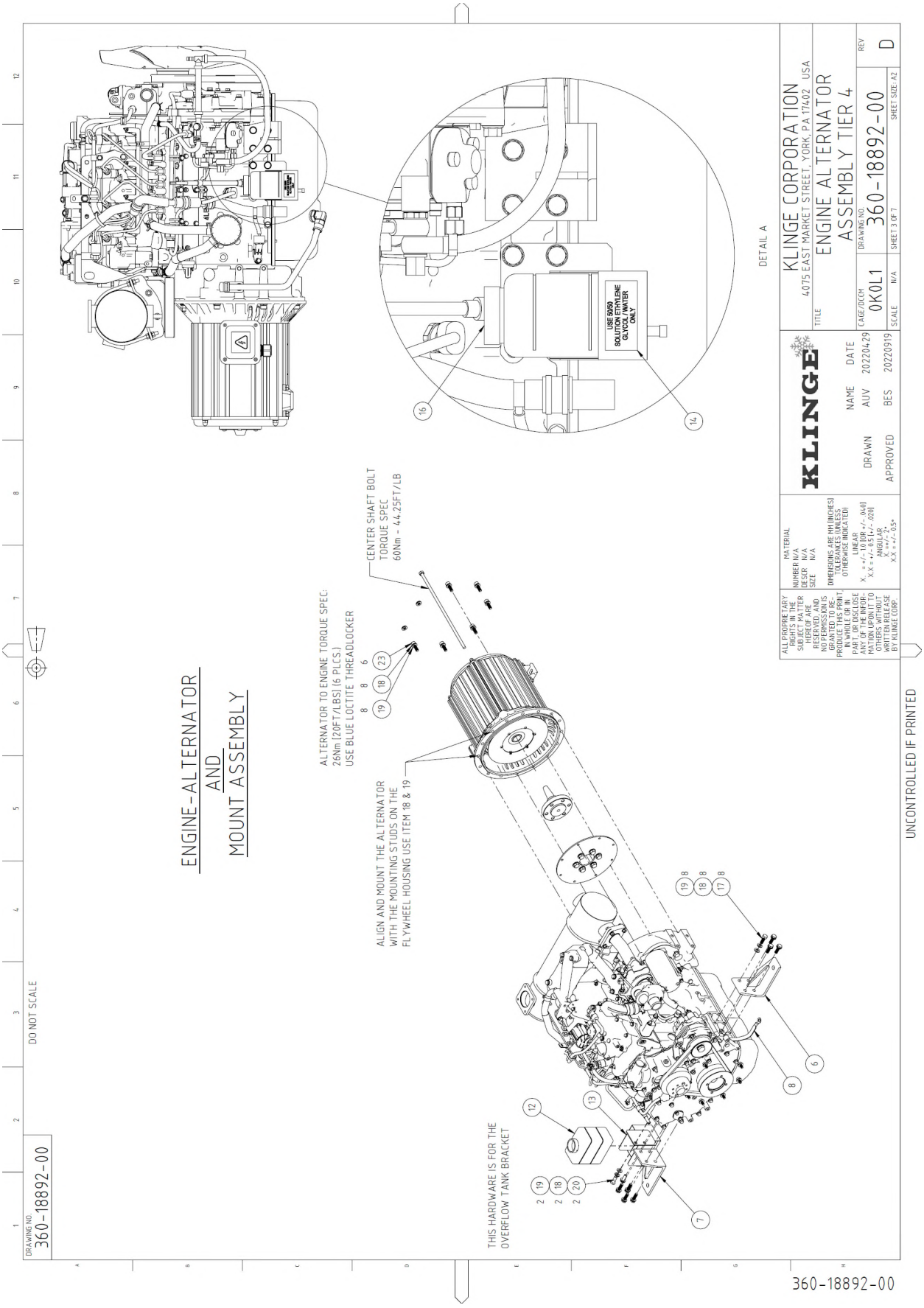
TITLE: ENGINE ALTERNATOR ASSEMBLY TIER 4

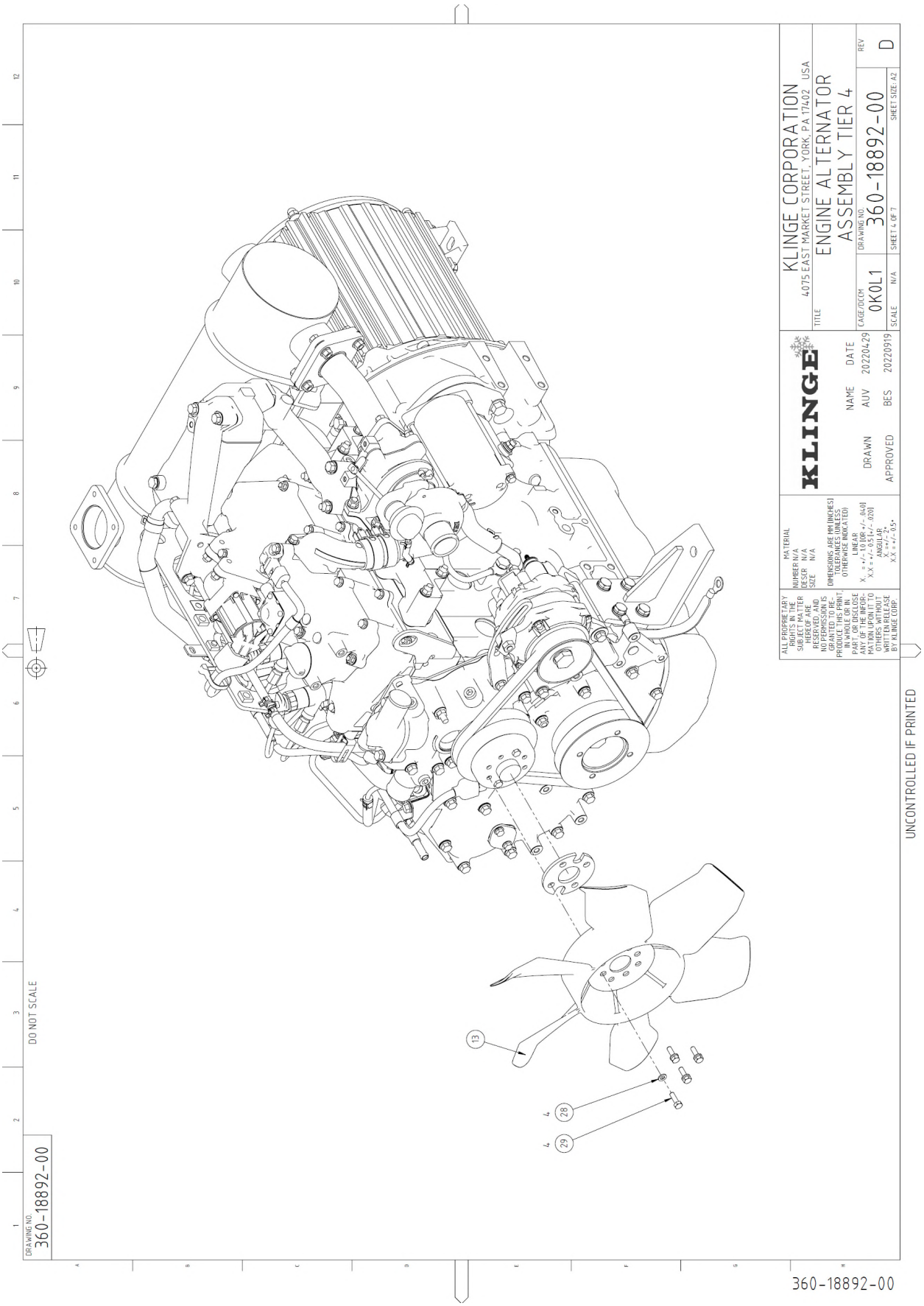
CAGE/DCCM: 0K0L1
DRAWING NO.: 360-18892-00
REV: D
SCALE N/A
SHEET 1 OF 7
SHEET SIZE: A2

360-18892-00

UNCONTROLLED IF PRINTED


ALTERNATOR PRE-ASSEMBLY
DRAWING NO. 360-18892-00
DO NOT SCALE
STEP 1: REMOVE THE BLACK COVER PLATE ON BACK OF THE ALTERNATOR AND REMOVE THE CENTER SHAFT BOLT
STEP 2: CONNECT FLY WHEEL TO ADAPTER USING THE PROVIDED HARDWARE NOTE: USE FIXTURE #F360-18950-00 TO ASSEMBLE ADAPTER AND FLYWHEEL
HARDWARE TORQUE SPEC 20Nm - 14.75 FT/LBS USE BLUE LOCTITE THREADLOCKER
STEP 3: ASSEMBLED FLYWHEEL MOUNT TO THE ENGINE BELL HOUSING
DRIVE DISC TO FLYWHEEL TORQUE SPEC 21Nm - 16FT/LBS 8 PLACES USE BLUE LOCTITE THREADLOCKER
NOTES:
1. FOLLOW SHEET 3 FOR ENGINE-ALTERNATOR ASSEMBLY
UNCONTROLLED IF PRINTED
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
ENGINE ALTERNATOR ASSEMBLY TIER 4
DRAWING NO. 360-18892-00
REV D
SHEET 2 OF 7
SHEET SIZE A2
360-18892-00


ENGINE-ALTERNATOR AND MOUNT ASSEMBLY
DO NOT SCALE
DRAWING NO. 360-18892-00
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
ENGINE ALTERNATOR ASSEMBLY TIER 4
DRAWING NO. 360-18892-00
REV D
SHEET 3 OF 7
SHEET SIZE: A2
CAGE/DCCM 0K0L1
SCALE N/A
DETAIL A
USE 50/50 SOLUTION ETHYLENE GLYCOL/WATER ONLY
ALTERNATOR TO ENGINE TORQUE SPEC: 26Nm [20FT/LBS] (6 PLCS.) USE BLUE LOCTITE THREADLOCKER
CENTER SHAFT BOLT TORQUE SPEC 60Nm - 44.25FT/LB
ALIGN AND MOUNT THE ALTERNATOR WITH THE MOUNTING STUDS ON THE FLYWHEEL HOUSING USE ITEM 18 & 19
THIS HARDWARE IS FOR THE OVERFLOW TANK BRACKET
UNCONTROLLED IF PRINTED
360-18892-00


KLINGE CORPORATION
4075 EAST MARKET STREET YORK PA 17402 USA
TITLE
ENGINE ALTERNATOR ASSEMBLY TIER 4
CAGE/DLCM 0K0L1
DRAWING NO. 360-18892-00
REV D
SCALE N/A
SHEET 4 OF 7
SHEET SIZE A2
KLINGE
NAME DATE
DRAWN AUV 20220429
APPROVED BES 20220919
MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A
DIMENSIONS ARE MM (INCHES) TOLERANCES UNLESS OTHERWISE INDICATED)
LINEAR
X = +/-.10 OR +/-.0401
X.X = +/-.05 +/-.0201
ANGULAR
X =+/-2°
X.X =+/-.05°
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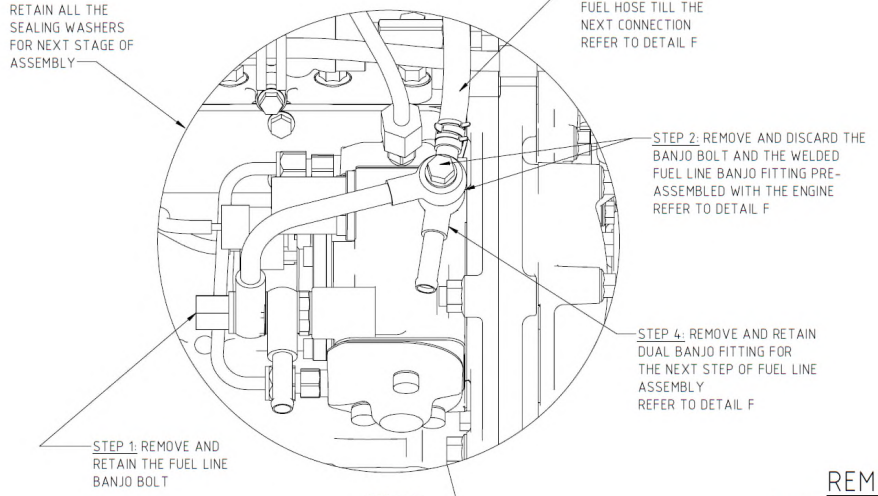
DRAWING NO. 360-18892-00
DO NOT SCALE
UNCONTROLLED IF PRINTED
13
4
28
4
29
360-18892-00

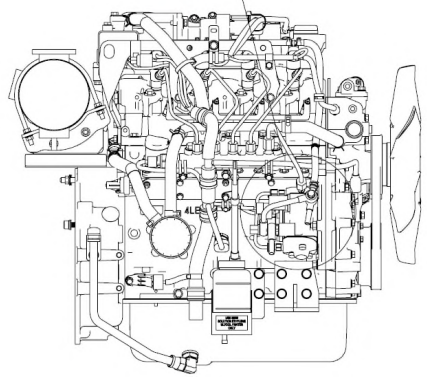
DRAWING NO: 360-18892-00

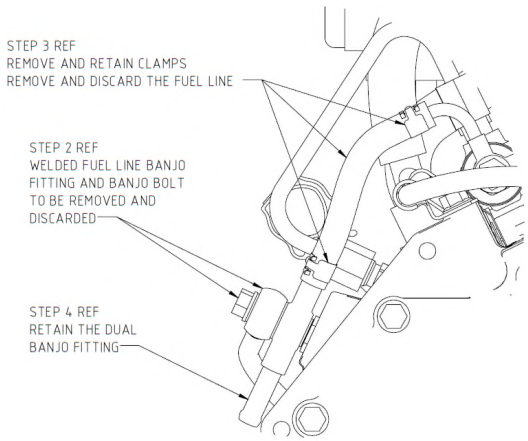
DO NOT SCALE

REMOVING COMPONENTS FROM PRE-ASSEMBLED FUEL LINE SYSTEM

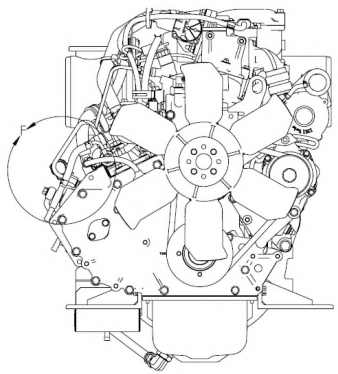


DETAIL E





DETAIL F



ITEMS TO BE RETAINED FROM THE DISASSEMBLY AND TO BE USED LATER IN THE ASSEMBLY- REFER SHEET 6

1. FUEL BANJO BOLT - DETAIL E - STEP 1
2. CLAMPS - DETAIL E - STEP 3
3. DUAL BANJO FITTING - DETAIL E- STEP 4
4. SEALING WASHERS

ALL PROPRIETARY RIGHTS IN THE SUBJECT MATTER HEREOF ARE RESERVED, AND NO PERMISSION IS GRANTED TO RE-PRODUCE THIS PRINT, IN WHOLE OR IN PART, OR DISCLOSE ANY OF THE INFOR-MATION UPON IT TO OTHERS WITHOUT WRITTEN RELEASE BY KLINGE CORP.

MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A

DIMENSIONS ARE MM [INCHES]
TOLERANCES (UNLESS OTHERWISE INDICATED)
LINEAR
X. = +/- 1.0 [OR +/- .040]
X.X = +/- 0.5 [+/- .020]
ANGULAR
X. = +/- 2°
X.X = +/- 0.5°

KLINGE

	NAME	DATE
DRAWN	AUV	20220429
APPROVED	BES	20220919

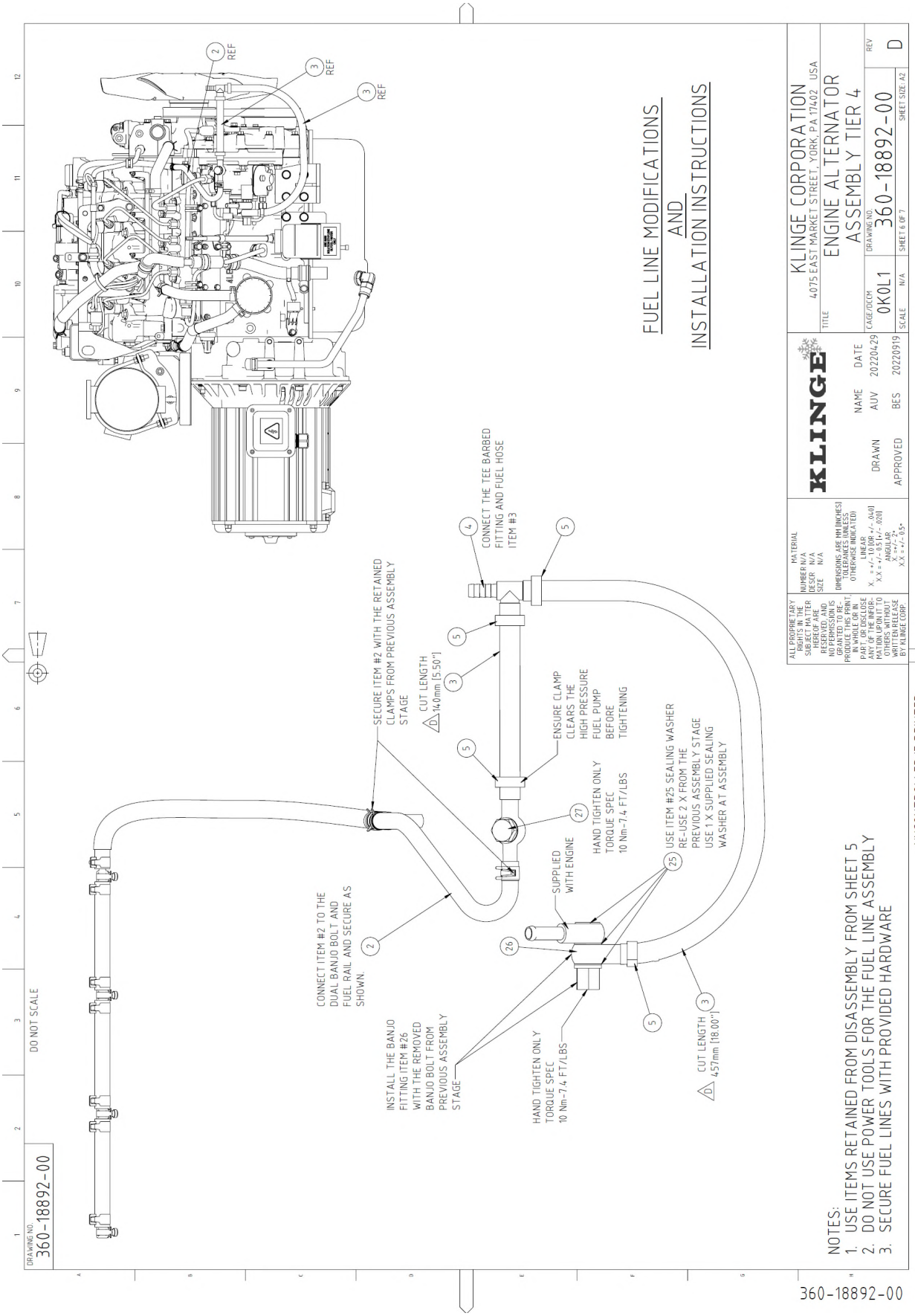
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA

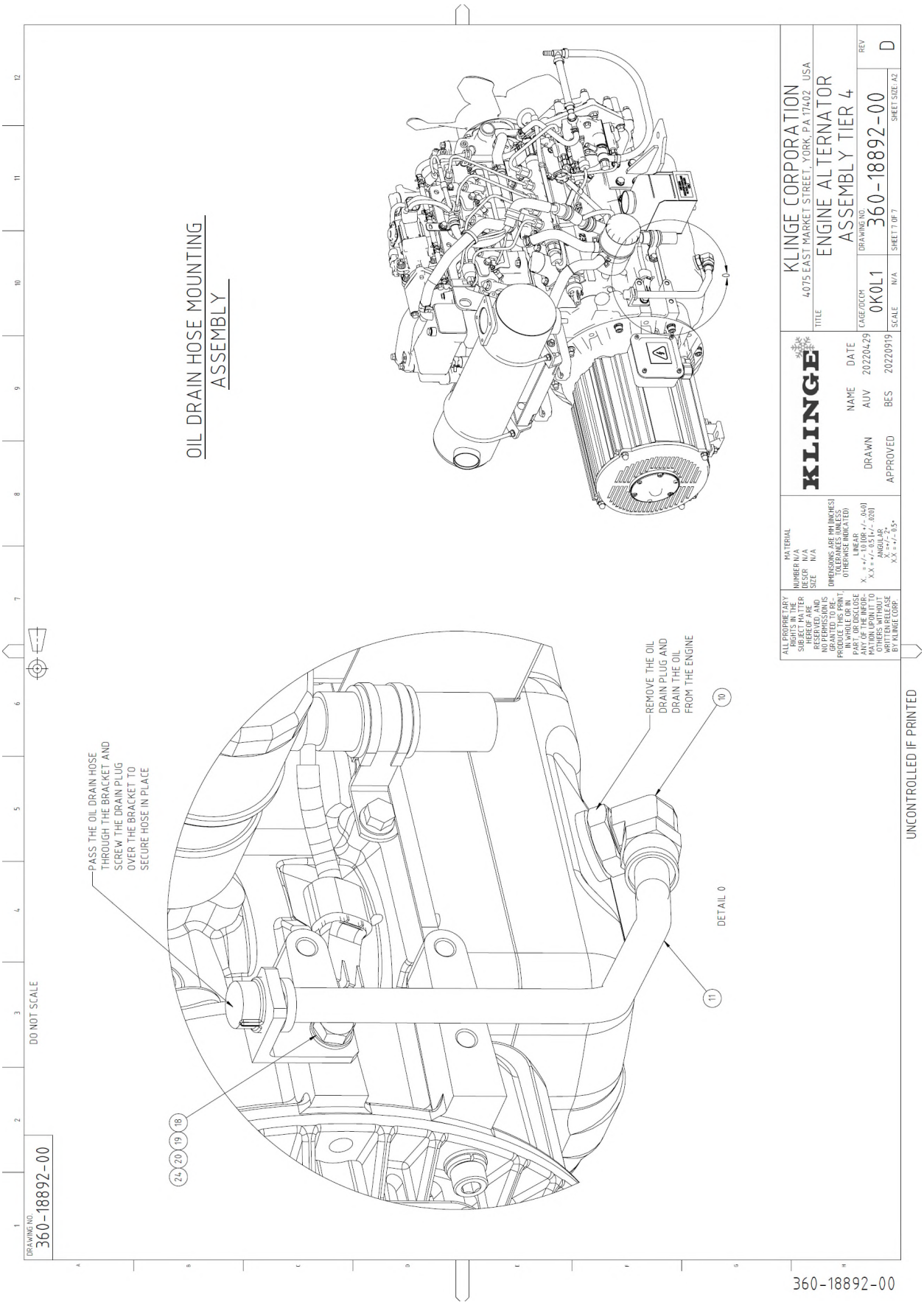
TITLE: ENGINE ALTERNATOR ASSEMBLY TIER 4

CAGE/DCCM	DRAWING NO.	REV
0K0L1	360-18892-00	D

SCALE N/A SHEET 5 OF 7 SHEET SIZE: A2

360-18892-00


FUEL LINE MODIFICATIONS
AND
INSTALLATION INSTRUCTIONS
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK PA 17402 USA
ENGINE ALTERNATOR ASSEMBLY TIER 4
DRAWING NO. 360-18892-00
REV D
CAGE/DSCM 0K0L1
SCALE N/A
SHEET 6 OF 7
SHEET SIZE A2
DRAWN NAME AUV DATE 20220429
APPROVED BES 20220919
KLINGE
DO NOT SCALE
DRAWING NO. 360-18892-00
CONNECT ITEM #2 TO THE DUAL BANJO BOLT AND FUEL RAIL AND SECURE AS SHOWN.
INSTALL THE BANJO FITTING ITEM #26 WITH THE REMOVED BANJO BOLT FROM PREVIOUS ASSEMBLY STAGE
HAND TIGHTEN ONLY TORQUE SPEC 10 Nm-7.4 FT/LBS
SECURE ITEM #2 WITH THE RETAINED CLAMPS FROM PREVIOUS ASSEMBLY STAGE
CUT LENGTH 140mm [5.50"]
CONNECT THE TEE BARBED FITTING AND FUEL HOSE ITEM #3
ENSURE CLAMP CLEARS THE HIGH PRESSURE FUEL PUMP BEFORE TIGHTENING
HAND TIGHTEN ONLY TORQUE SPEC 10 Nm-7.4 FT/LBS
SUPPLIED WITH ENGINE
USE ITEM #25 SEALING WASHER RE-USE 2 X FROM THE PREVIOUS ASSEMBLY STAGE USE 1 X SUPPLIED SEALING WASHER AT ASSEMBLY
CUT LENGTH 457mm [18.00"]
NOTES:
1. USE ITEMS RETAINED FROM DISASSEMBLY FROM SHEET 5
2. DO NOT USE POWER TOOLS FOR THE FUEL LINE ASSEMBLY
3. SECURE FUEL LINES WITH PROVIDED HARDWARE
UNCONTROLLED IF PRINTED
360-18892-00


OIL DRAIN HOSE MOUNTING
ASSEMBLY
PASS THE OIL DRAIN HOSE THROUGH THE BRACKET AND SCREW THE DRAIN PLUG OVER THE BRACKET TO SECURE HOSE IN PLACE
REMOVE THE OIL DRAIN PLUG AND DRAIN THE OIL FROM THE ENGINE
DETAIL 0
DO NOT SCALE
DRAWING NO. 360-18892-00
UNCONTROLLED IF PRINTED
360-18892-00
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK PA 17402 USA
ENGINE ALTERNATOR ASSEMBLY TIER 4
CAGE/DECM 0K0L1
DRAWING NO. 360-18892-00
REV D
SCALE N/A
SHEET 7 OF 7
SHEET SIZE A2
KLINGE
NAME DATE
DRAWN AUV 20220429
APPROVED BES 20220919
MATERIAL
NUMBER N/A
FINISH N/A
DESCR N/A
SIZE N/A
DIMENSIONS ARE MM [INCHES] TOLERANCES UNLESS OTHERWISE INDICATED
LINEAR
X.x = +/- .10 [OR +/- .040]
X.X = +/- .05 [+/- .020]
ANGULAR
X = +/- 2°
X.X = +/- .05°
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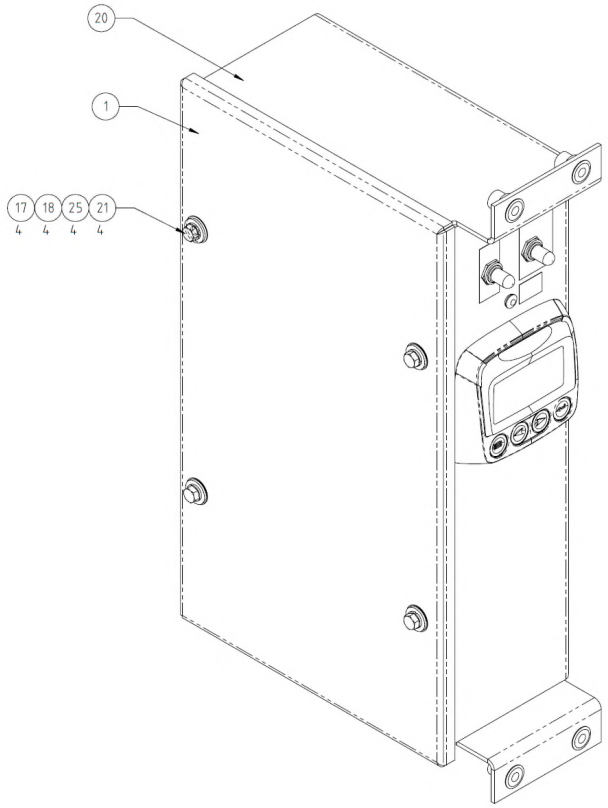
DRAWING NO. 360-18922-00

DO NOT SCALE

REV	DATE	DESCRIPTION	CHANGE NO	DRAWN	APPROVED
A	20221102	CHANGE ITEM 17 FROM (K21-16685-06) TO (K21-18510-06). ADD ITEM 31 (K28-10995-010). ADD NOTES ON THE PARTS THAT COME WITH ENGINE.	22-255	LAH	BES
B	20221114	ADD ITEM 32 AND CHANGE SIZE OF HARD FOR BAP SENSOR. CHANGED VIEWS OF MODELS. CHANGES IN NOTES.	22-260	LAH	BES
C	20221228	BALLOON 17 WAS 22 SECTION B-B SHEET 2, ADDED ITEM #33 SHEET 2, ROTATED RELAY SOCKET 180° SHEET 2	22-321	DBG	BES
D	20240417	ITEM #17 QTY WAS 7, ADDED ITEM #34, ITEM #34 REPLACES ITEM #17 SECTION B-B SHEET 2, TITLE WAS BOX CONTROL WHITE	24-054	DBG	BES



ITEM NO	PART NO	DESCRIPTION	QTY
D 34	K21-15797-06	WASHER LOCK EXT INT SS 1/4"	1
33	360-18949-00	CABLE BATTERY CHARGER DISCONNECT WITH PLUG	1
32	K21-50421-05	WASHER, LOCK, SPRING, STAINLESS STEEL, M5 X 9.2 X 1.2	2
31	K28-10995-010	RING O EPDM .25 ID X .375 OD X .06 W	1
30	360-18947-00	WIRING CONTROL	1
29	360-18941-00	HARNESS CONTROL	1
28	K21-16583-06	NUT LOCK SS M6 X 1 NYLON INSERT	2
27	K21-50103-06	NUT HEX M6 THIN 18-8 SS	1
26	K21-50224-18	SCREW HEX SS M6 X 1 X 18	2
25	K21-50421-06	WASHER, LOCK, SPRING, STAINLESS STEEL, M6 X 12.2 X 1.5	5
24	K21-50401-05	WASHER, FLAT, STAINLESS STEEL, M5 X 10 X 1	2
23	K21-16400-06	SCR PAN SS M5x0.8x25MM FULLY THREADED 18-8	2
22	360-18935-00	HARNESS ENGINE NMG TIER 4	1
21	K21-50224-25	SCREW, HEX, STAINLESS STEEL, FULL THREAD, M6 X 1.00 X 25	4
20	360-18921-01	BOX CONTROL ENCLOSURE ASSY PAINTED NMG TIER 4	1
19	K21-18425-04	WASH FLAT SS BONDED NEOP 1/4 0.275 ID .625 OD	2
18	K21-16547-06	WASHER, FLAT, STAINLESS STEEL, M6 X 18 X 1.6	7
D 17	K21-18510-06	WASHER INSULATED PVC M6	6
16	K21-18420-16	SCREW FLAT HEAD PHILLIPS SS M6-1 X 16	4
15	060-18933-01	MOUNT BRACKET RIGHT ECM PAINTED	1
14	060-18932-01	MOUNT BRACKET LEFT ECM PAINTED	1
13	K26-25310-13	POWERVIEW GENERATOR DISPLAY - 4LE2TAGV	1
12	K35-06744-00	LABEL RPM	1
11	K35-06745-00	LABEL START/ON/OFF	1
10	K35-06746-00	LABEL PREHEAT	1
9	360-18958-00	LED RED W/ FERRULE	1
8	K24-22416-00	SWITCH SPST 12V 20A ON / OFF SCREW TERMINAL	1
7	K24-17239-00	BOOT TOGGLE SWITCH	2
6	K24-22556-00	SWITCH TOGGLE 3 POS OFF-ON-MOM	1
5	K25-26147-01	RING SEAL PLASTIC 1/2	1
4	K25-26340-02	NUT LOCK PLASTIC 1/2	1
3	K25-26129-03	CONNECTOR STAIGHT PLASTIC SHORT 1/2	1
2	XB-993011-20	RUBBER NEOPRENE 1/4 X 2 X 12" DUROMETER 70	1
1	360-18948-00	DOOR ASSEMBLY CONTROL BOX NMG TIER 4	1

NOTES:
1. USE ANTI-SEIZE KLINGE P/N K13-02069-00 ON ALL STAINLESS STEEL FASTENERS.
2. ITEM 29 AND 30 NOT SHOWN IN DRAWING.

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MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A

DIMENSIONS ARE MM [INCHES]
TOLERANCES (UNLESS OTHERWISE INDICATED)
LINEAR
X. = +/- 1.0 [OR +/- .040]
X.X = +/- 0.5 [+/- .020]
ANGULAR
X. = +/- 2°
X.X = +/- 0.5°

KLINGE

	NAME	DATE
DRAWN	AUV	20220720
APPROVED	BES	20220928

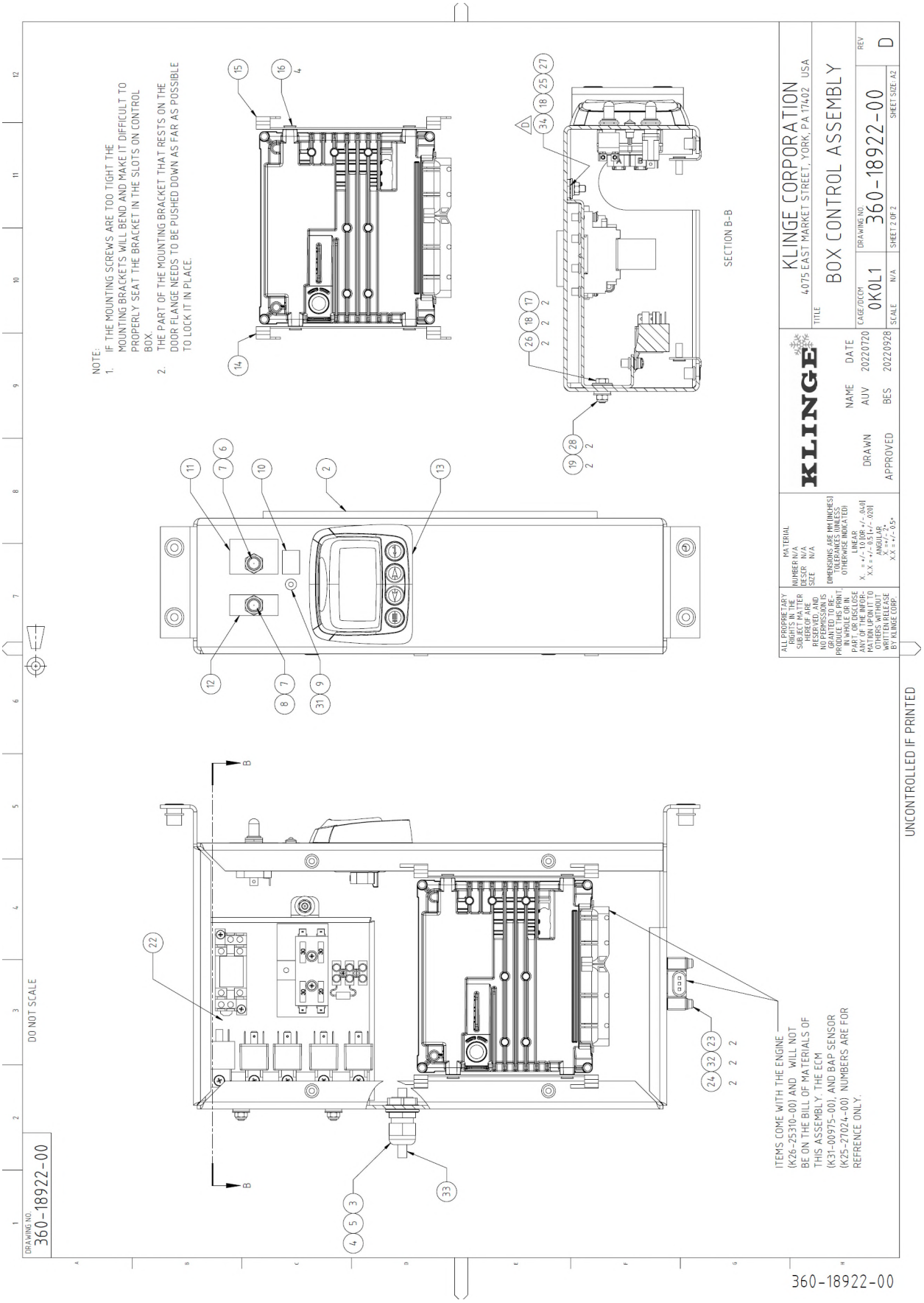
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA

TITLE: BOX CONTROL ASSEMBLY

CAGE/DCCM: 0K0L1 | DRAWING NO.: 360-18922-00 | REV: D
SCALE N/A | SHEET 1 OF 2 | SHEET SIZE: A2

360-18922-00

UNCONTROLLED IF PRINTED


NOTE:
1. IF THE MOUNTING SCREWS ARE TOO TIGHT THE MOUNTING BRACKETS WILL BEND AND MAKE IT DIFFICULT TO PROPERLY SEAT THE BRACKET IN THE SLOTS ON CONTROL BOX.
2. THE PART OF THE MOUNTING BRACKET THAT RESTS ON THE DOOR FLANGE NEEDS TO BE PUSHED DOWN AS FAR AS POSSIBLE TO LOCK IT IN PLACE.
SECTION B-B
ITEMS COME WITH THE ENGINE (K26-25310-00) AND WILL NOT BE ON THE BILL OF MATERIALS OF THIS ASSEMBLY. THE ECM (K31-00975-00), AND BAP SENSOR (K25-27024-00) NUMBERS ARE FOR REFRENCE ONLY.
DO NOT SCALE
DRAWING NO. 360-18922-00
KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA
TITLE
BOX CONTROL ASSEMBLY
CAGE/DSCPM 0K0L1
DRAWING NO. 360-18922-00
REV D
SCALE N/A
SHEET 2 OF 2
SHEET SIZE A2
KLINGE
NAME DATE
DRAWN AUV 20220720
APPROVED BES 20220928
MATERIAL
NUMBER N/A
DESCR N/A
SIZE N/A
DIMENSIONS ARE MM [INCHES] TOLERANCES UNLESS OTHERWISE INDICATED
LINEAR
X = +/-.10 OR +/-.004
X.X = +/-.05 +/-.002
ANGULAR
X = +/-2°
X.X = +/-.5°
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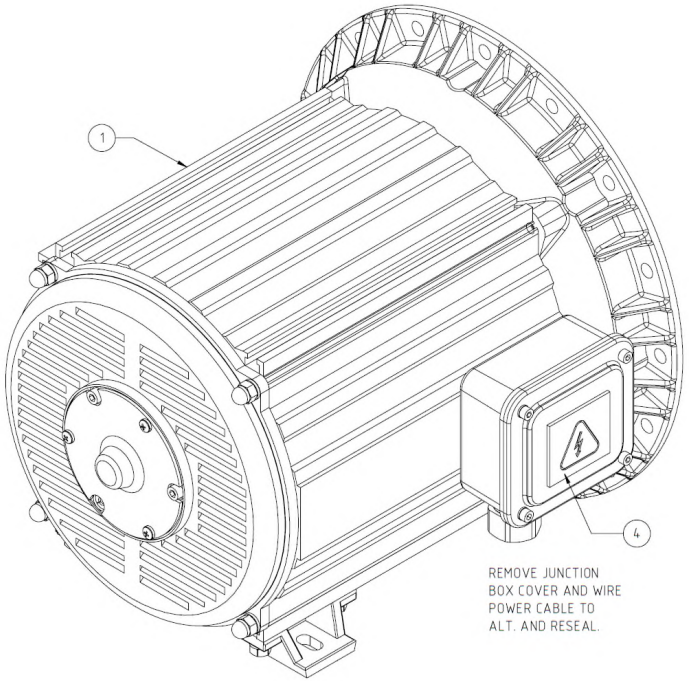
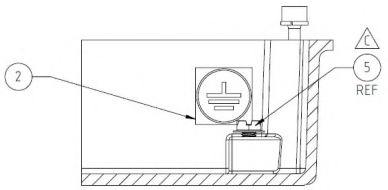
UNCONTROLLED IF PRINTED
360-18922-00

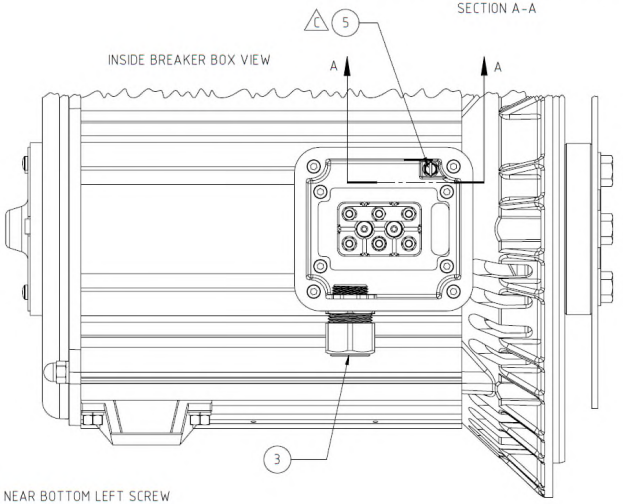
DRAWING NO. 360-18951-00

DO NOT SCALE

REV	DATE	DESCRIPTION	CHANGE NO	DRAWN	APPROVED
A	20221219	MOVED JUMPERS TO UPPER SIDE OF TERMINAL BLOCK, ADDED ITEM #16	22-310	DBG	BES
B	20230329	CHANGED ALT. BREAKER BOX BACK TO JUNCTION BOX AND MOVE BREAKER BOX. CHANGED LABELS AND LOCATIONS.	23-066	LAH	BES
C	20240212	ADDED ITEM #5	24-017	DBG	BES







NOTE: THE ROUTING OF THE POWER CABLE HAS CHANGED. IT WILL BE COMING DOWN THROUGH TOP PANEL TO THE ALT. WHEN MAINTAINING OR REPAIRING DISCONNECT FROM ALTERNATOR FOR EASIER ACCESS THAN FROM INSIDE THE THE BREAKER BOX.

ITEM NO	PART NO	DESCRIPTION	QTY
5	K21-16694-00	SCREW HEX HEAD GROUNDING #10-32 X 1/2"	1
4	K35-06752-00	LABEL DANGER HIGH VOLTAGE 2.26 x 1.97	1
3	K25-26761-26	CONNR STR PLST M25 (12,3-18,0 mm)	1
2	K35-06539-00	LABEL GROUND SYMBOL FMV	1
1	K24-22540-03	ALTERNATOR RFL 4-30 JUNCTION BOX RIGHT	1

NOTES:
1. USE ANTI-SEIZE KLINGE P/N K13-02069-00 ON ALL STAINLESS STEEL FASTENERS

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MATERIAL
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DESCR N/A
SIZE N/A

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TOLERANCES (UNLESS OTHERWISE INDICATED)
LINEAR
X. = +/- 1.0 [OR +/- .040]
X.X = +/- 0.5 [+/- .020]
ANGULAR
X. = +/- 2°
X.X = +/- 0.5°

KLINGE

	NAME	DATE
DRAWN	LH	20230302
APPROVED	BES	20221024

KLINGE CORPORATION
4075 EAST MARKET STREET, YORK, PA 17402 USA

TITLE
ALTERNATOR RFL-30 MODIFIED

CAGE/DCCM	DRAWING NO.	REV
0K0L1	360-18951-00	C

SCALE N/A SHEET 1 OF 1 SHEET SIZE: A2

360-18951-00

UNCONTROLLED IF PRINTED