

OPERATION & PARTS MANUAL



NIGHTHAWK SERIES MODELS LT-12D, LT-12P DEDICATED LIGHT TOWER (DEUTZ/LOMBARDINI DIESEL ENGINE) (PERKINS DIESEL ENGINE)


Revision #8 (12/07/05)

To find the latest revision of this
publication, visit our website at:
www.multiquip.com




THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES.

P/N: 29543



WARNING



CALIFORNIA — Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

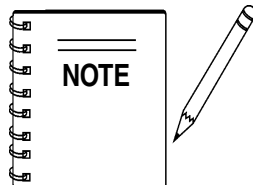
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For Deutz/Lombardini Parts information, please see our LT-12 Deutz F3M1008F Diesel Engine Parts Manual.

PARTS ORDERING PROCEDURES

When ordering parts, please supply the following information:

- Dealer account number
- Dealer name and address
- Shipping address (if different than billing address)
- Return fax number
- Applicable model number
- Quantity, part number and description of each part
- Specify preferred method of shipment:
 - ✓ FedEx or UPS Ground
 - ✓ FedEx or UPS Second Day or Third Day
 - ✓ FedEx or UPS Next Day
 - ✓ Federal Express Priority One
 - ✓ DHL
 - ✓ Truck

Note: Unless otherwise indicated by customer, all orders are treated as "Standard Orders", and will ship within 24 hours. We will make every effort to ship "Air Shipments" the same day that the order is received, if prior to 2PM west coast time. "Stock Orders" must be so noted on fax or web forms.



Here's how to get help...

Please have the model and serial number on hand when calling.

MULTIQUIP CORPORATE OFFICE

18910 Wilmington Ave. 800-421-1244
 Carson, CA 90746 FAX: 310-537-3927
 Email: mq@multiquip.com
 Internet: www.multiquip.com

PARTS DEPARTMENT

800-427-1244 FAX: 800-672-7877
 310-537-3700 FAX: 310-637-3284

MAYCO PARTS

800-306-2926 FAX: 800-672-7877
 310-537-3700 FAX: 310-637-3284

SERVICE DEPARTMENT

800-421-1244 FAX: 310-537-4259
 310-537-3700

TECHNICAL ASSISTANCE

800-478-1244 FAX: 310-631-5032

WARRANTY DEPARTMENT

800-421-1244, EXT. 279 FAX: 310-537-1173
 310-537-3700, EXT. 279

Place Your Parts Order Via Web or Fax For Even More Savings!

(Domestic USA Dealers Only)

Extra Discounts!

All parts orders which include complete part numbers and are received by our automated web parts order system, or by fax qualify for the following extra discounts:

Ordered via	Standard orders	Stock orders (\$750 list and above)
Fax	3%	10%
Web	5%	10%

Special freight allowances when you order 10 or more line items via Web or Fax! **

FedEx Ground Service *at no charge for freight*

No other allowances on freight shipped by any other carrier.

***Common nuts, bolts and washers (all items under \$1.00 list price) do not count towards the 10+ line items.*

NOTE: DISCOUNTS ARE SUBJECT TO CHANGE



MULTIQUIP INC.
 18910 WILMINGTON AVENUE
 POST OFFICE BOX 6254
 CARSON, CALIFORNIA 90749
 310-537-3700 • 800-421-1244
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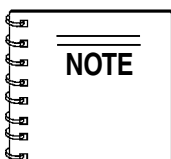
Direct TOLL-FREE access to our Parts Department:

Toll-free nationwide — 800-427-1244
 Toll-free FAX — 800-6-PARTS-7 (800/672-7877)

LT-12 SERIES LIGHT TOWER — SAFETY MESSAGE ALERT SYMBOLS

FOR YOUR SAFETY AND THE SAFETY OF OTHERS!

Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the Safety Messages and Operating Instructions could result in injury to yourself and others.



This Owner's Manual has been developed to provide complete instructions for the safe and efficient operation of the **LT-12 Series Light Tower**.

Before using this Light Tower, ensure that the operating individual has read and understands all instructions in this manual.

SAFETY MESSAGE ALERT SYMBOLS

The three (3) Safety Messages shown below will inform you about potential hazards that could injure you or others. The Safety Messages specifically address the level of exposure to the operator, and are preceded by one of three words: **DANGER**, **WARNING**, or **CAUTION**.

DANGER

You **WILL** be **KILLED** or **SERIOUSLY** injured if you **DO NOT** follow directions.

WARNING

You **CAN** be **KILLED** or **SERIOUSLY** injured if you **DO NOT** follow directions.

CAUTION

You **CAN** be **INJURED** if you **DO NOT** follow directions.

Potential hazards associated with the **LT-12 Series Light Tower** operation will be referenced with Hazard Symbols which appear throughout this manual, and will be referenced in conjunction with Safety Message Alert Symbols.

HAZARD SYMBOLS

WARNING - Lethal Exhaust Gasses

Engine exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled. **NEVER** operate this equipment in a confined area or enclosed structure that does not provide ample free flow air.



WARNING - Explosive Fuel

Diesel fuel is extremely flammable, and its vapors can cause an explosion if ignited. **DO NOT** start the engine near spilled fuel or combustible fluids.

DO NOT fill the fuel tank while the engine is running or hot. **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system. Store fuel in approved containers, in well-ventilated areas and away from sparks and flames.



WARNING - Burn Hazards

Engine components can generate extreme heat. To prevent burns, **DO NOT** touch these areas while the engine is running or immediately after operations. Never operate the engine with heat shields or heat guards removed.



CAUTION - Respiratory Hazard

ALWAYS wear approved **respiratory** protection when required.



LT-12 SERIES LIGHT TOWER — SAFETY MESSAGE ALERT SYMBOLS

! CAUTION - Rotating Parts

NEVER operate equipment with covers, or guards removed. Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.

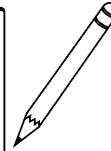
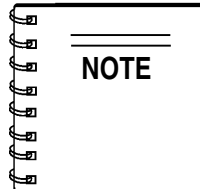


! CAUTION - Equipment Damage Messages

Other important messages are provided throughout this manual to help prevent damage to your light tower, other property, or the surrounding environment.

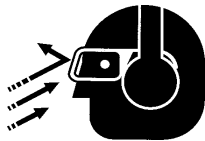
! CAUTION - Accidental Starting

ALWAYS place the power source, circuit breakers or **ON/OFF** switch in the **OFF** position, when the generator is not in use, unless connected to transfer switch.



This light tower, other property, or the surrounding environment could be damaged if you **do not** follow instructions.

! CAUTION - Sight and Hearing Hazards



ALWAYS wear approved eye and hearing protection.

! CAUTION - Over-Speed Conditions



NEVER tamper with the factory settings of the engine governor settings. Personal injury and damage to the engine or equipment can result if operating speed ranges above maximum allowable.

LT-12 SERIES LIGHT TOWER — RULES FOR SAFE OPERATION

WARNING - READ THIS MANUAL

Failure to follow instructions in this manual may lead to **Serious Injury** or even **Death**. This equipment is to be operated by trained and qualified personnel only! This equipment is for industrial use only.

The following safety guidelines should always be used when operating the Lt-12 Lighttower.

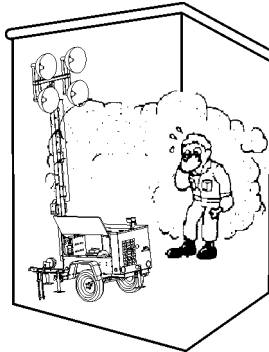
Safety


- **DO NOT** operate or service this equipment before reading this entire manual.
 - This equipment should not be operated by persons under 18 years of age.
 - **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, steel-toed boots and other protective devices required by the job.
- 
- 




- **NEVER** operate this equipment when not feeling well due to fatigue, illness or taking medicine.
 - **NEVER** operate the saw under the influence of drugs or alcohol.
 - **NEVER** use accessories or attachments, which are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to user may result.
 - Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.
 - Whenever necessary, replace nameplate, operation and safety decals when they become difficult read.
 - **ALWAYS** check all the bolts on the light tower for tightness.
 - **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing engine or generator.
 - **High Temperatures** – Allow the engine to cool before adding fuel or performing service and maintenance functions. Contact with *hot* components can cause serious burns.
- 

- The engine of this light tower/generator requires an adequate free flow of cooling air. **NEVER** operate the generator in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause serious damage to the generator engine and may cause injury to people. Remember the engine of the light tower/generator gives off **DEADLY** carbon monoxide gas.



- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
 - **ALWAYS** use extreme caution when working with **flammable** liquids. When refueling, **stop the engine** and allow it to cool. **DO NOT smoke** around or near the machine. Fire or explosion could result from fuel vapors, or if fuel is spilled on a hot engine.
- 
- **NEVER** operate the light tower/generator in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe *bodily harm or even death*.
 - Topping-off to filler port is dangerous, as it tends to spill fuel.
 - **ALWAYS** make sure that the light tower/generator is secure on level ground so that it cannot slide or shift around, endangering workers. Also keep the immediate area free of bystanders.
 - **ALWAYS** use a **trained technician** to install and remove a floodlight, or replace any damaged fixture wiring.
 - **NEVER** leave any grease or oil residue on glass surface when replacing or removing bulbs. This can create hot spots, reducing the service life of the bulb or causing outer jacket to burst.
 - **ALWAYS** make sure trailer is leveled with all outriggers extended before raising tower. Outriggers must remain extended while tower is up.
 - **ALWAYS** keep area behind trailer clear of people while raising and lowering mast.
 - **NEVER** remove safety pin or pull mast locking pin while tower is in a raised position!
 - **CHECK** the mast and winch cables for wear. If any problem occurs when lower or raising the tower **STOP** immediately! Contact a trained technician for assistance.
 - **NEVER** pivot or retract mast while unit is operating.

LT-12 SERIES LIGHT TOWER — RULES FOR SAFE OPERATION

⚠ DANGER - High Danger Areas

The **5 DANGER** items listed below are considered **High DANGER** areas and should be adhered to. Failing to understand these areas could result in **Bodily Harm, Electrical Shock, Electrocutation, and even Death!** Please pay close attention when operating the light tower.

⚠ DANGER - Grounding the LT-12 for Operation

The LT-12 Light tower is equipped with a **ground terminal** for your protection. **ALWAYS** complete the **grounding path** from the light tower to an external grounding source.



ALWAYS make certain the light tower is well grounded and securely fastened to a good earth ground (ground rod). The possibility exists of **Electrical Shock, Electrocutation, and even Death** if the light tower is not grounded.

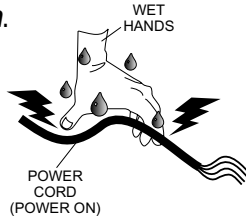
⚠ DANGER - Electric Shock Hazards

NEVER operate the LT-12 Light tower or handle any electrical equipment while standing in water, while bare foot, while hands are wet, or in the rain. A dangerous **electrical shock** could occur causing **Severe Bodily Harm or even Death.**



ALWAYS keep electrical cords in good condition. Worn, bare or frayed wiring can cause electrical shock, thus causing **Bodily Harm or even Death.**

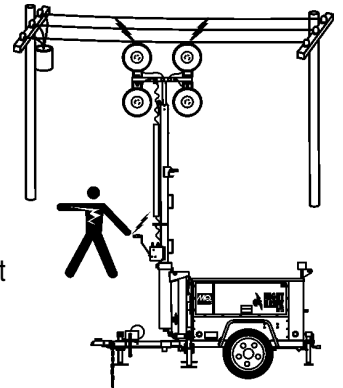
NEVER grab or touch a live power cord with wet hands, the possibility exists of **Electrical Shock, Electrocutation, and even Death!**



- **NEVER** use the light tower mast as a crane. **DO NOT** lift anything with the mast.
- **NEVER** attach anything to the light tower mast.
- **ALWAYS** keep the immediate area surrounding the light tower clean, neat, and free of debris.
- **ALWAYS** lower the tower when not in use, or if high winds or electrical storms are expected in the area.
- **NEVER** pivot or retract mast while unit is operating.

⚠ DANGER - Overhead Obstruction Danger

ALWAYS make sure the area above Light tower is open and clear of overhead power lines and other obstructions. The tower extends in excess of 30 ft. (9 meters). Contact with overhead powerlines or other obstructions could result in equipment damage, **Serious Injury or Death!**



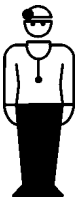
- **NEVER touch** bulbs while in use. Bulbs become extremely hot when in use! Allow bulbs and fixture to cool at least 10-15 minutes before handling.
- **ALWAYS** retract the mast before lowering the tower to transport position.

Maintenance Safety

- **NEVER** lubricate components or attempt service on a running light tower/generator.
- **ALWAYS** allow the light tower/generator a proper amount of time to cool before servicing.
- Keep the light tower/generator in proper running condition.
- Fix damage to the light tower/generator immediately and always replace broken parts.

Emergencies

- **ALWAYS** know the location of the nearest **fire extinguisher**.
- **ALWAYS** know the location of the nearest **first aid kit**.
- In emergencies **always** know the location of the nearest phone or **keep a phone on the job site**. Also know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



LT-12 SERIES LIGHT TOWER — OPERATION AND SAFETY DECALS

Machine Safety Decals

This dedicated light tower is equipped with a number of safety decals. These decals are provided for operator safety and maintenance information. The illustration below and on the next page shows these decals as they appear on the machine. Should any of these decals become unreadable, replacements can be obtained from your dealer.



P/N: 29126



P/N 29119



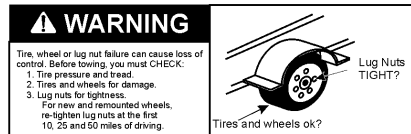
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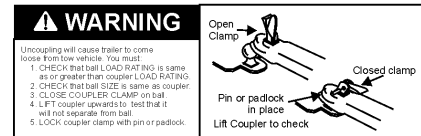
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P/N: 29131



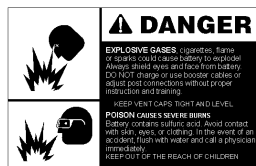
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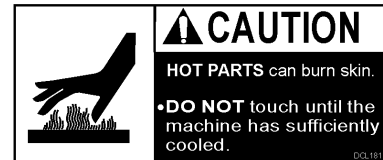
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P/N: DCL191



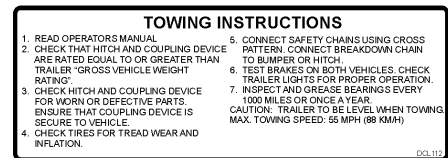
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P/N: DCL182



P/N: DCL184



P/N: 29127



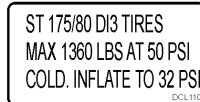
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P/N: DCL186



P/N: 29121



P/N: 29125



P/N: 29133



P/N: 29116



P/N: 29124



P/N 29120



P/N: DCL187

Figure 1. Operation and Safety Decals

LT-12 SERIES LIGHT TOWER — OPERATION AND SAFETY DECALS

WARNING

ATTACH HOOKS TO TOW VEHICLE FRAME

ALWAYS use safety chains. Chains hold trailer if connection fails. You must:

- CROSS chains underneath coupler.
- ALLOW slack for trailer to turn.
- ATTACH chain hooks securely to tow vehicle frame.

CROSS CHAINS

ENOUGH SLACK FOR TURNS

P/N: 29743

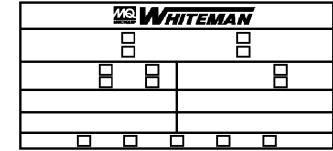
WARNING

DISCONNECTED CONNECTED

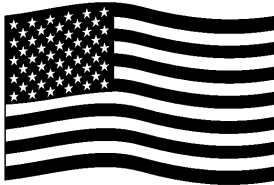
Lights can prevent trailer from being hit by other vehicles. You must:

- CONNECT trailer and tow vehicle electrical connectors.
- CHECK all lights, tail lights, turn signal, and brake lights.
- DO NOT TOW if lights are not working.

P/N: 29472



CONTACT PARTS DEPT.



P/N: 29730

240 VAC/30A MAIN BREAKER

P/N: DCL199

120 VAC/15A G.F.C.I. BREAKER

P/N: DCL189

LIGHT CONTROL/BREAKER

P/N: 29130

CAUTION

SHUT DOWN GENERATOR BEFORE CHANGING LAMPS

P/N: 29132

WARNING

FAILURE TO TURN OFF LIGHTS BEFORE STOPPING ENGINE MAY RESULT IN GENERATOR DAMAGE AND VOID WARRANTY

P/N: 29128

WARNING

ELECTRICAL SHOCK HAZARD

- Electrically ground trailer frame to earth before operating genset.
 - Screw all jacks firmly against ground.
 - For extra safety, also drive in ground rod and connect cable to stud welded to trailer frame.
- Keep light fixture receptacles dry.
 - Screw caps on hand light to seal receptacles when not in use.
 - Do not screw light fixture into receptacle if receptacle is wet.
- Beware of cut power cord.
 - When raising, lowering or rotating tower, be sure to watch power cord.
 - If power cord gets cut or crushed, replace before operating light tower.
- Turn off genset when performing electrical work.
 - Turn off genset before re-lamping fixture.
 - Turn off genset before replacing ballast.
- Take extra precautions when troubleshooting electrical problems.
 - Only use a voltmeter with two well insulated pin probes rated for 600 volts.
 - Ground trailer frame securely with all jacks and a backup ground cable.
 - Inspect ground cable between genset and trailer frame.
 - Treat all conductors as potentially hot.
 - Proceed through circuits systematically, operating only one section at a time.
 - Before disconnecting ballast, turn off circuit breaker and wait 30 seconds for capacitor to discharge.
 - If all the lights are out and the ballasts are receiving power, suspect burned out power cable. Shut down genset and fully inspect power cable and junction box.

P/N: 29118

OPERATING INSTRUCTIONS

START ENGINE GENERATOR

- Check the levels of the engine oil, fuel and coolant.
- Make sure all circuit breakers and auxiliary switches are in the OFF position before starting engine. CAUTION: Starting generator under load can cause damage.
- If the engine is fitted with a glow plug, turn the key to the preheat position and hold for 3-5 sec.
- Turn the key to the "START" position and hold until the engine starts, then release.

CAUTION: If the engine does not start in 20 seconds, release key and repeat steps 3 & 4.

NOTE: If unit is equipped with Auto-Stop/Start, the system will automatically shut off the fuel supply if oil pressure is not obtained within 30 seconds after key is turned to "ON" position. You must return the key to the "OFF" position to restart the 30-second timer if engine does not start.

TURN ON THE FLOODLIGHTS

- Once engine achieves operating speed and is running smoothly, turn on each floodlight control lever to the "ON" position.

NOTE: Floodlights require a warm-up of 5-15 minutes before they reach full output. If fuel-cooled, a 10-minute cool-down is required before restarting.

P/N: 29134

WARNING

DANGEROUS GAS FUMES

- Only operate machine in well ventilated areas.
- DO NOT inhale exhaust gases.
- Only qualified personnel should install, use or service this equipment.

P/N: DCL187

WARNING

CALIFORNIA — Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

P/N: DCL197

CAUTION

OIL LEVEL DIPSTICK

Before starting the engine, check that the oil level is within the indicated operating range. If the level is above the H mark or below the L mark, it is important to correct before operating to avoid damage to the engine.

P/N: DCL193

CAUTION

CHECK DAILY

- Maintain water/coolant level at top of reservoir caps.
- Maintain reserve tank water/coolant level between H and L marks. Use a mixture of 50/50 Ant-Freeze/Water.
- Add coolant when reserve tank is low (L). Fill to the H mark with Ant-Freeze/Water.

WATER COOLANT LEVEL

RESERVE TANK

P/N: DCL194

DANGER HIGH VOLTAGE

P/N: 29047

WARNING

STAY CLEAR OF BOOM

P/N: 29123

DANGER!

TO PREVENT SERIOUS INJURY OR DEATH

ALWAYS MAKE SURE AREA ABOVE TOWER MAST IS OPEN AND CLEAR OF OVERHEAD POWER LINES. THE TOWER MAST EXTENDS IN EXCESS OF 30 FT. (9 METERS).

P/N: 29651

WARNING

OVER-HEAD HAZARD TO PREVENT SERIOUS INJURY OR DEATH

- Level trailer before use.
- Do not raise, lower or use light tower unless all outriggers and jacks are positioned on firm ground.
- Watch out for overhead obstructions, such as trees and high voltage power lines.

P/N: 29135

WARNING

ALL JACKS MUST BE SWIVELED TO HORIZONTAL BEFORE MOVING TRAILER

P/N: DCL106

WARNING

HOT COOLANT can cause severe burns

- DO NOT remove cap if radiator is hot

P/N: DCL183

Figure 1. Operation and Safety Decals (Continued)

LT-12 SERIES LIGHT TOWER — SPECIFICATIONS (LIGHT TOWER)

TABLE 1. SPECIFICATIONS		
Light Tower Model	LT-12D	LT-12P
Engine Model	Deutz F3m1008F/ Lombardini LDW 1003 Diesel Engine	Perkins 103-10 Diesel Engine
Weight (Dry)	1,550 lbs. (700 kg.)	
Dimensions	See Table 3	
Support Points	5	
Wind Stability with Genset.	65 mph (80.46 kph)	
Floodlights	4-1,000 Watt Metal Halide	
Lumens	440,000	
Light Coverage	5 to 7 acres	
Light Termination	4 x 3-pin QD plug	
Generator Specifications		
GFCI Receptacle Output	120 VAC @ 15 A	
Twist-Lock Receptacle Output	240 VAC @ 25 A	
GFCI Circuit Breaker (Amps)	15 A	
Twist-Lock Circuit Breaker (Amps)	25 A	
Continuous Output (Watts)	6,000 W	
Noise Level @ 23 ft. (7 m)	73 db.	
Trailer Specification		
Jackstand Capacity	2,000 lbs. (907 kg.)	
Hitch Type	2 in. Ball (Optional Pintle Kit available)	
Tire Size	13 in. (330 mm.)	
Tire Rim Size	13 x 4.5 in. (330 x 114 mm)	
Axle Capacity	2,000 lbs. (907 kg.)	
Hub Type	5-Lug	
Suspension Type	3-Leaf	
Electrical Tail-light Connector	4-Wire	
Winch Capacity	1,500 lbs. (680 kg.)	
Winch Rope Wire	3/16 in.	

LT-12 SERIES LIGHT TOWER — SPECIFICATIONS (ENGINES)

Table 2. Engine Specifications

Perkins Model 103-10 Diesel Engine	Engine Type	Aspirated 4-stroke, 3-cylinder, 1 liter Diesel Engine
	Bore X Stroke	2.95 in. X 2.83 in. (75 mm x 72 mm)
	Displacement	58.21 cu. in. (954 cc)
	Max Output Standby	12 H.P. at 1,800 R.P.M.
	Max Output Prime	10.5 H.P. at 1,800 R.P.M.
	Fuel Tank Capacity	Approx. 30 U.S. Gallons (113 Liters)
	Run Time With 4 Lights	64 Hours
	Standard Idle Speed	1,800 R.P.M.
	Fuel Type	N0. 2 Diesel Fuel
	Lube Oil Capacity	7.4 U.S. Pints (3.5 Liters)
	Cooling System	Water-cooled
	Coolant Capacity	8.0 U.S. Pints (3.8 Liters)
	Starting Method	Electric Start
	Battery Type	Group 12
	Total Weight (Dry)	280 lbs. (127 Kg.)
Total Weight (Wet)	287 lbs. (130 Kg.)	
Lombardini Model LDW 1003/Diesel Engine or Deutz Model F3M008F Diesel Engine	Engine Type	3-cylinder, Diesel Engine
	Displacement	62.73 cu. in. (1028 cc)
	Max Output Standby	12 H.P. at 1,800 R.P.M.
	Fuel Tank Capacity	Approx. 30 U.S. Gallons (113 Liters)
	Run Time With 4 Lights	64 Hours
	Standard Idle Speed	1,800 R.P.M.
	Fuel Type	N0. 2 Diesel Fuel
	Oil Sump Capacity	2.5 U.S. Quarts (2.36 Liters)
	Cooling System	Liquid-cooled
	Starting Method	Electric Start
	Battery Type	Group 24
Total Weight (Dry)	187.3 lbs. (85 Kg.)	

LT-12 SERIES LIGHT TOWER — DIMENSIONS

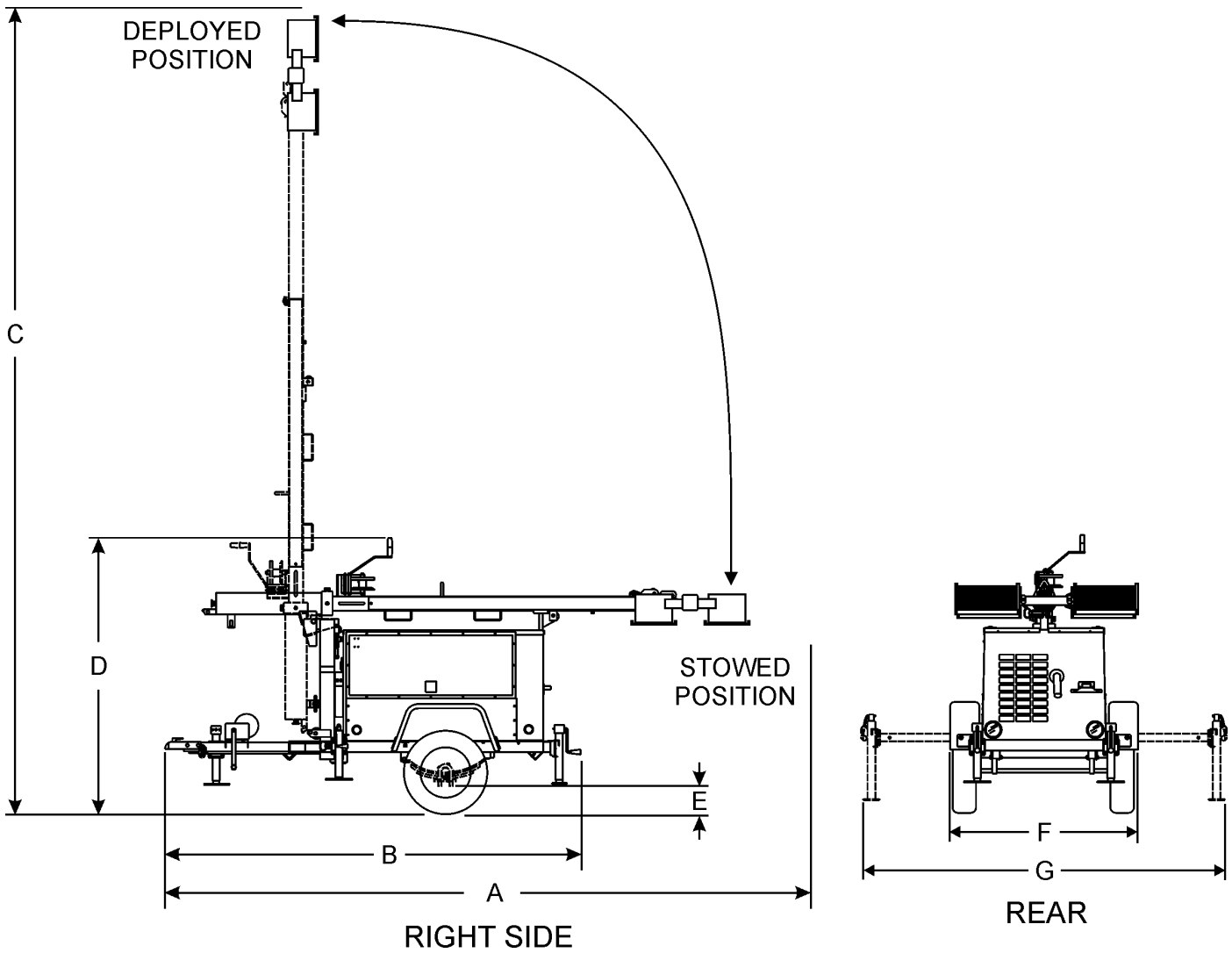


Figure 2. Dimensions

TABLE 3. DIMENSIONS		
Reference Letter	Description	Dimension in. (mm.)
A	Length (Mast Stowed Position)	170 in. (431 cm.)
B	Length (Mast Deployed Position)	101 in. (256 cm.)
C	Max. Height (Mast Deployed Position)	31.5 ft. (9.6 m)
D	Height (Mast Stowed Position)	74 in. (187 cm.)
E	Ground Clearance (From Axle)	8 in. (20 cm.)
F	Width (Tow Ready)	51 in. (129 cm.)
G	Width (Outriggers Deployed)	109 in. (276 cm.)

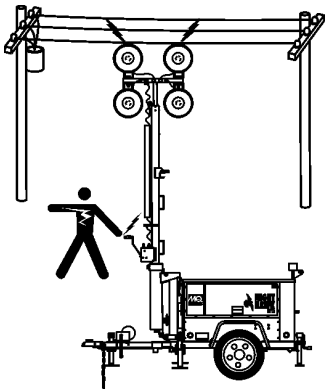
LT-12 SERIES LIGHT TOWER — GENERAL INFORMATION

The Multiquip LT-12 Series Light Tower is a dedicated general purpose floodlight tower intended for emergency and remote lighting conditions.

The light tower can be raised vertically in excess of 31.5 feet (9.6 meters) by means of a manual winch. The tower tensioning system is designed to provide the necessary tension to safely control the pivot of the tower. Outriggers and rear support stand must be deployed prior to raising the mast.

! DANGER - Overhead Obstruction Danger

ALWAYS make sure the area above Light tower is open and clear of overhead power lines and other obstructions. The tower extends in excess of 30 ft. (9 meters). Contact with overhead powerlines or other obstructions could result in equipment damage, ***Serious Injury or Death!***

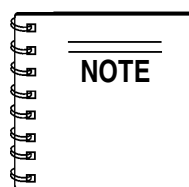


The lighting system of Multiquip's LT-12 Series Light Tower is comprised of 4 "Metal Halide" 1000 watt lamps. Each lamp has an output of 110,000 lumens yielding a total of 440,000 lumens for all four floodlights. Typical lighting coverage is between 5 to 7 acres.

Each floodlight requires a ballast for starting. Located on the control panel of the generator is a weather resistant ballast box that contains the ballast for each floodlight. The control panel contains four ON/OFF circuit breakers for each floodlight.

For ease of service or transport, each floodlight is equipped with a quick-disconnect connector that allows the lamp fixture to be removed quickly. This feature is extremely useful during transport of the light tower over rough terrain. It is always best to remove the floodlights and pack them safely so they will not get damaged.

As an added feature, the LT-12 is available with two auxiliary output receptacles. The upper most receptacle (twist-lock), located at the front of the light tower, can provide 240 VAC at 25 amps. The bottom receptacle is a GFCI receptacle which can supply 120 VAC at 15 amps. These receptacles that can be used for light power tools or other similar applications.



Some LT-12 Light towers are equipped with a Lombardini Diesel Engine. All procedures & references to Deutz engines in this manual may be applied to Lombardini engines unless specifically noted otherwise.

LT-12 SERIES LIGHT TOWER — COMPONENTS

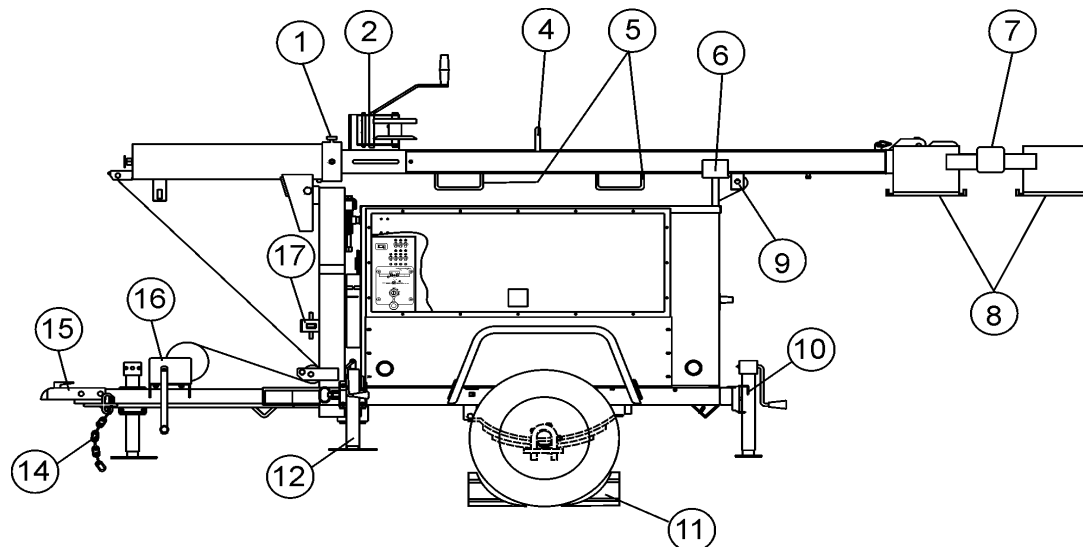


Figure 3. Major Components (Control Panel Side)

Figure 3 and 4 shows the location of the controls and components for the Lt-12 Series Light Tower. The functions of each control is described below:

1. **Mast Rotation Locking Knob** – Unscrew this knob to release mast for rotation.
2. **Vertical Mast Extension Winch** – Use this winch to extend the mast to the desired height. Maximum height is approximately 31.5 feet (9.6 meters).
3. **Mast Rotation Handle** – Grip this handle to rotate mast to desired position. To lock mast tighten mast rotation locking knob.
4. **Lifting Bail** – When lifting of the light tower by crane is required, use this lifting bail. Note: this lifting bail is balanced for a **fully configured** light tower; removal of any light tower components will un-balance the lifting bail.
5. **Forklift Pockets** – When lifting of the light tower is required, use these fork lift pockets to lift the light tower. Remember to insert the forks of the fork lift a minimum of 24 inches into the mast fork lift pockets.
6. **Mast Cradle Support** – When towing of the light tower is required, place the tower mast into the cradle support. Make sure tower release pin has been inserted and mast is locked.
7. **T-Bar** – Allows the floodlights to be mounted vertically or horizontally.
8. **Flood Light** – 1000 watt "Metal Halide" type bulb with a 110,000 lumens capacity. Light coverage is typically between 5 to 7 acres.
9. **Tower Lock/Release Pin** – Pull this pin to release tower mast from cradle support.
10. **Jack Stands** – There are two trailer jack stands, which are located at the front and rear of the trailer. Use these 2 jack stands to level and support the light tower.
11. **Chock Blocks** – Place these blocks (not included as part of the light tower package) under each trailer wheel to prevent rolling.
12. **Outrigger Jacks** – Use these 2 outrigger jacks to level and support the light tower.
13. **Control Panel/ Ballast Compartment** – This panel contains the ON/OFF circuit breakers for each flood light. In addition, located behind the control panel are the ballasts and electrical components for each floodlight.
14. **Safety Chain** – Always attach safety chain to the towing vehicle. Never tow the light tower with the safety chain unattached.
15. **Ball Hitch Coupler** – Attach this coupler to the towing vehicle. Use only the specified ball diameter as indicated on your coupler. Use of any other ball diameter will create an extremely dangerous condition which can result in separation of the coupler and ball or ball failure.
16. **Vertical Mast Winch** – Use this winch to raise the mast to the vertical position. Once mast is in the full vertical position the locking pin engages automatically.
17. **Mast Locking/Release Pin** – Pull this pin to start placing the tower mast in the vertical position. Locking pin automatically engages when tower mast has reached full vertical position.

LT-12 SERIES LIGHT TOWER — COMPONENTS

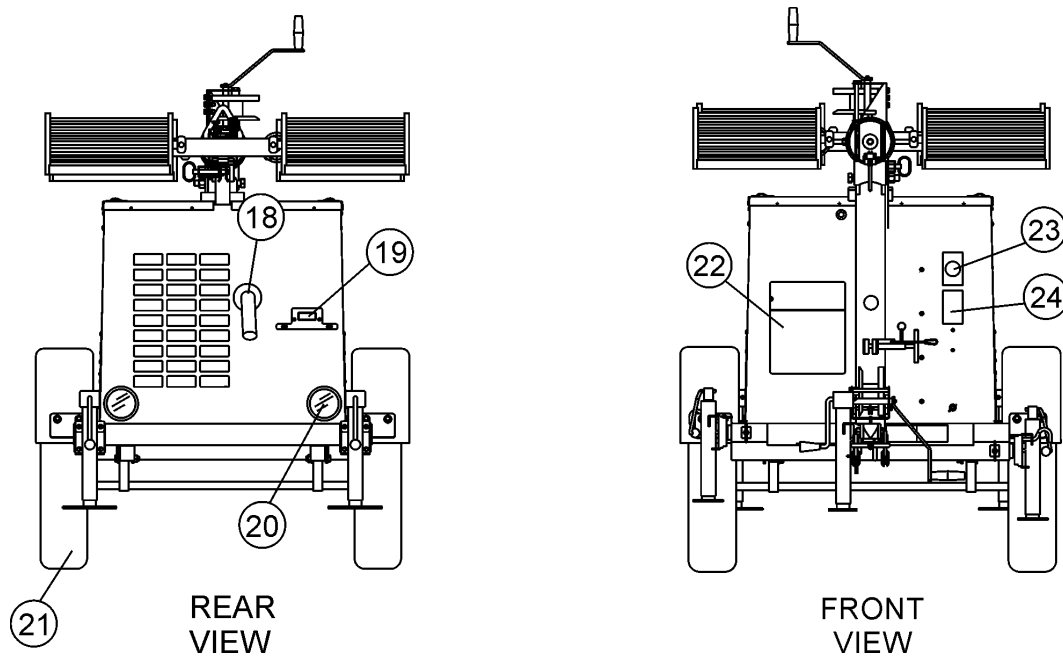


Figure 4. Major Components (Front/Rear)

18. **Engine Exhaust Pipe**— Directs engine exhaust to the rear of the light tower. **NEVER** block this exhaust pipe with obstructions. **ALWAYS** place the generator in an area free of obstructions.

21. **Tires**— This light tower uses a ST175-13C size tire. Replace with only recommended tire size. **NEVER** tow light tower with bad or worn tires.

22. **Documentation Box**— Contains information regarding the light tower.

23. **240 VAC Twist-Lock Receptacle**— This twist-lock receptacle provides 240 VAC, 25 amps.

24. **120VAC GFCI Receptacle**— This GFCI receptacle provides 120 VAC, 15 amps.

CAUTION - Burn Hazard

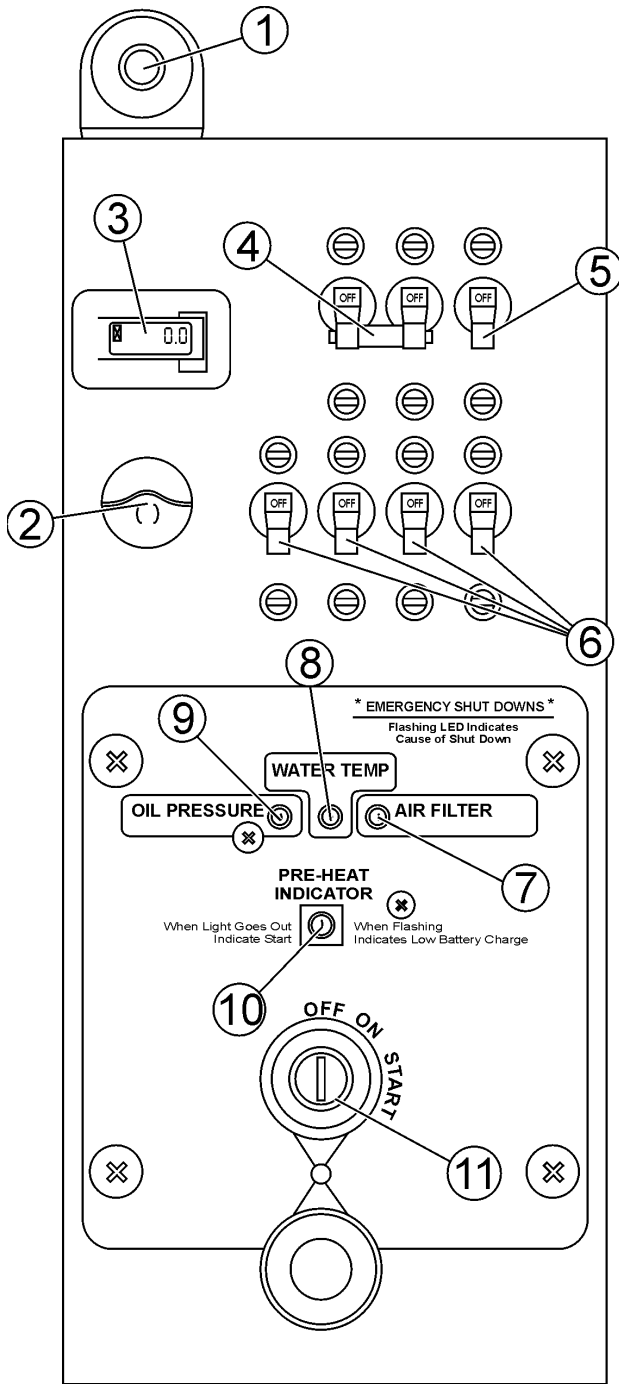
The exhaust pipe will become extremely hot when the engine is in use. **NEVER** touch the exhaust pipe when the engine is running. The possibility exists of severe burns to the skin. Allow the exhaust pipe to **cool** before touching.



19. **License Light**— This light illuminates the license plate. Whenever towing of the light tower is required, make sure this light is operational.

20. **Brake Lights**— Before towing the light tower, make sure that these lights are operational and are working correctly. **NEVER** tow the light tower if these lights are inoperative.

LT-12 SERIES LIGHT TOWER — CONTROL PANEL

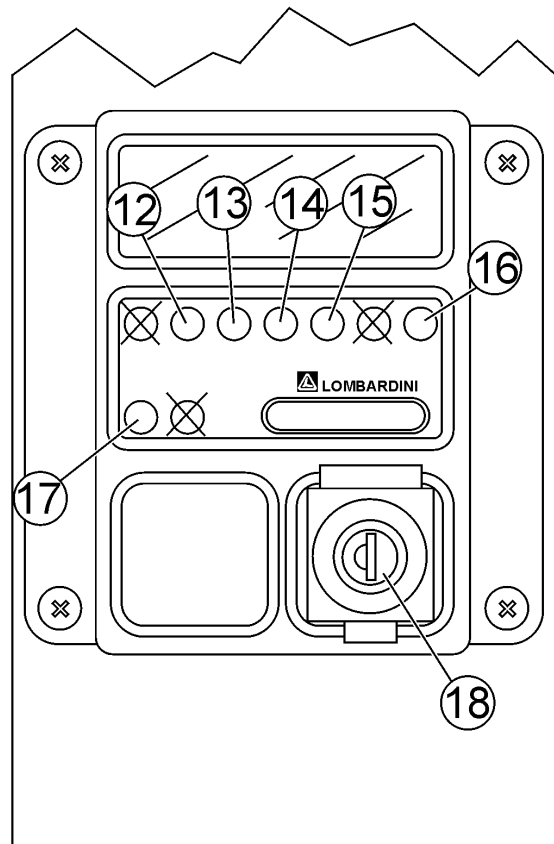


PERKINS ENGINE CONTROL PANEL

Figure 5. Control Panel Components and Indicators

DISPLAY = NOT USED

⊗ = NOT USED



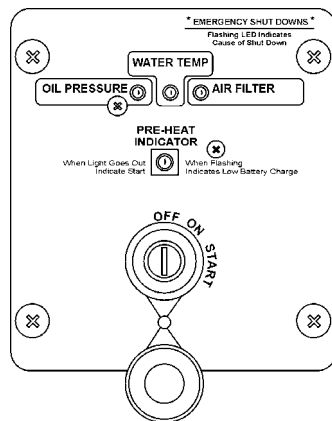
LOMBARDINI ENGINE CONTROL PANEL

LT-12 SERIES LIGHT TOWER — CONTROL PANEL

Figure 5 shows the location of the basic control panel components for the LT-12 Light Tower. Listed below is a brief explanation of each control or component.

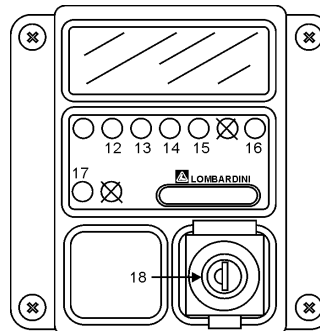
1. **Internal Cabinet Light Switch** – This switch controls the internal cabinet light for the light tower control panel. When the cabinet door is raised, the light will automatically come on. When the cabinet door closes, the switch is depressed and the light turns off.
2. **Internal Cabinet Light** – Provides illumination for the LT-12 control panel during nighttime operation. The light is activated when the cabinet door is raised.
3. **Hour Meter** – This digital hour meter indicates the number of hours machine has been in use.
4. **Main Circuit Breaker** – A double-pole 25 amp, ON/OFF circuit breaker which protects the 240 VAC twist-lock receptacle from overload. In addition it allows voltage to be supplied to the GFCI receptacle and 15 amp breakers (4).
5. **GFCI Receptacle Circuit Breaker** – A single-pole, 15 amp, ON/OFF circuit breaker which protects the GFCI receptacle from overload.
6. **Flood Light Circuit Breakers** – A single-pole, 15 amp, ON/OFF circuit breaker for each floodlight (4).

Items 7 - 11 refer to the Perkins Engine Control Panel only. See Figure 5.










7. **Air Filter Indicator Alarm Light** – This alarm light flashes when a problem with the air filter is detected. Service as required.
8. **Water Temperature Alarm Light** – This alarm light flashes when the water temperature becomes too hot for normal engine operation. Service as required.
9. **Oil Pressure Alarm Light** – This alarm light flashes when the oil pressure has fallen to low for normal engine operation. Service as needed.

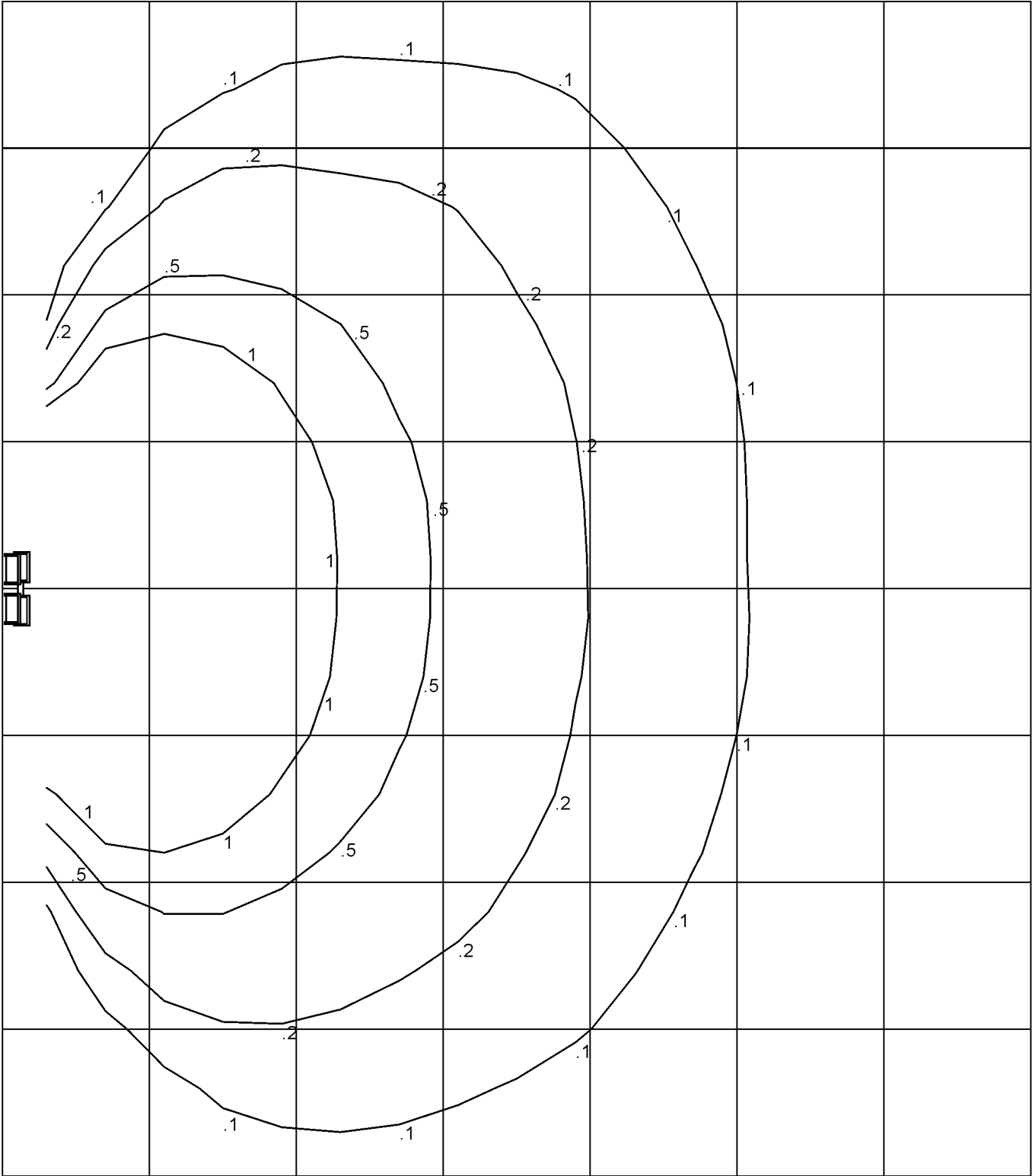
10. **Pre-Heat Indicator Light/Battery Charge Light** – Indicates when the glow plugs have been heated up for starting the engine. If the light is flashing, a low battery charge is detected.
11. **Ignition Key Switch** – Insert key into ignition switch and turn clockwise to the **ON** position to warm the glow plugs. When glow plug indicator light goes **OFF**, turn the key to the **START** position. Release key when engine starts.



Items 12 - 18 refer to the Lombardini Engine Control Panel only. See Figure 5.

12. **Normal Operation Indicator Light** – This indicator light is illuminated when the engine is functioning normally. 
13. **Low Oil Shutdown Indicator Light** – This indicator light is illuminated when the engine has shut down due to low oil pressure. Service as needed. 
14. **High Temperature Indicator Light** – This indicator light is illuminated when the engine has shut down due to high water temperature. Service as needed. 
15. **Alternator Indicator Light** – This indicator light is illuminated when the engine has shut down due to high water temperature. Service as needed. 
16. **Glow Plug Indicator Light** – This indicator light is illuminated when the glow plugs have been heated for starting the engine. 
17. **Air Filter Restriction Indicator Light** – This indicator light is illuminated when the engine has shut down due to blockage in the air filter. Service as needed. 
18. **Ignition Key Switch** – Insert key into ignition switch and turn clockwise to the **ON** position to warm the glow plugs. When glow plug indicator light goes **OFF**, turn the key to the **START** position. Release key when engine starts. 

LT-12 SERIES LIGHT TOWER — FLOOD LIGHT FOOTCANDLE PLOT



Light Plot represents a mast extended to 30' with 4 lights illuminated, tilted down 20°

Scale: 1 in. = 50 ft.

Figure 6. Floodlight Footcandle Plot (Area Coverage)

LT-12 SERIES LIGHT TOWER — TOWING GUIDELINES

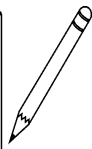
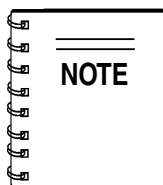
Towing Safety Precautions

CAUTION - Local Towing Regulations

Check with your county or state safety towing regulations department before towing your *light tower*.

To reduce the possibility of an accident while transporting the light tower on public roads, always make sure that the trailer and the towing vehicle are in good operating condition and both units are mechanically sound.

The following list of suggestions should be used when towing the light tower:



Remember, when transporting of the light tower is required, **always remove the floodlights** and pack them safely so they will not get damaged.

- Make sure that the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating" (GVWR). See Table 1 for light tower weight.
- **ALWAYS** inspect the hitch and coupling for wear. **NEVER** tow the light tower's trailer with defective hitches, couplings, chains etc.
- **CHECK** the tire air pressure on both the towing vehicle and the trailer. Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer section of the light tower is equipped with a "**Safety Chain**".
- **ALWAYS** attach trailer's safety chain to frame of towing vehicle.
- **ALWAYS** make sure that the vehicle and trailer directional, backup, brake, and trailer lights are connected properly and are working properly.
- Remember in most cases the maximum speed unless otherwise posted for highway towing is 55 MPH, however before towing your light tower, check your local state, and county vehicle towing requirements. Recommended off-road towing is not to exceed **15 MPH** or less depending on type of terrain.
- Place *chocked blocks* underneath wheel to prevent **rolling**, while parked.
- Depending on soil conditions and location it may be necessary to place *support blocks* underneath the trailer's bumper to prevent **tipping**, while parked.

- Inflate tires to correct pressure, inspect tires for cuts, and excessive wear. See Table 3 (Tire Wear Troubleshooting).
- Check wheel mounting lug nuts with a **torque wrench**. Torque wheel lug nuts as described in the "**Lug Nut Torque Requirements**", Table 5.
- Check tightness of hanger bolt, shackle bolt, and U-bolts nuts, torque suspension hardware per Table 4.
- Avoid sudden stops and starts. This can cause skidding, or jackknifing. Smooth, gradual starts and stops will improve gas mileage.
- Avoid sharp turns to prevent rolling.
- Swivle all jackstands parallel to the ground before transporting.
- **DO NOT** transport light tower with fuel in the generator fuel tank.

CAUTION - Defective/Damaged Trailer Couplings

If the trailer coupler is deformed replace entire coupler. **NEVER** tow the light tower with a defective trailer coupler. There exist the possibility of the trailer separating from the towing vehicle.

Light Tower Trailer Vehicle Connection

1. Check the vehicle hitch ball, and trailer coupler for signs of wear or damage. Replace any parts that are worn or damaged before towing.
2. Use only the 2-inch ball diameter as indicated on the trailer's coupler. Use of any other ball diameter will create an extremely dangerous condition which can result in separation of the coupler and ball or ball failure.
3. Be sure the coupler is secured to the hitch ball and the lock lever is down (locked).
4. Attach safety chains as shown in Figure 7. Remember to **cross** the safety chains.
5. After towing for about 50 miles recheck the entire towing system for tightness.

Recommended Maintenance

1. Smear ball socket and clamp face with chassis grease. Periodically oil pivot points and wear surfaces of the coupler with SAE 30 W motor oil.
2. When parking or storing the light tower, keep the coupler off the ground so dirt and other debris will not build up in the ball socket.

LT-12 SERIES LIGHT TOWER — TOWING GUIDELINES

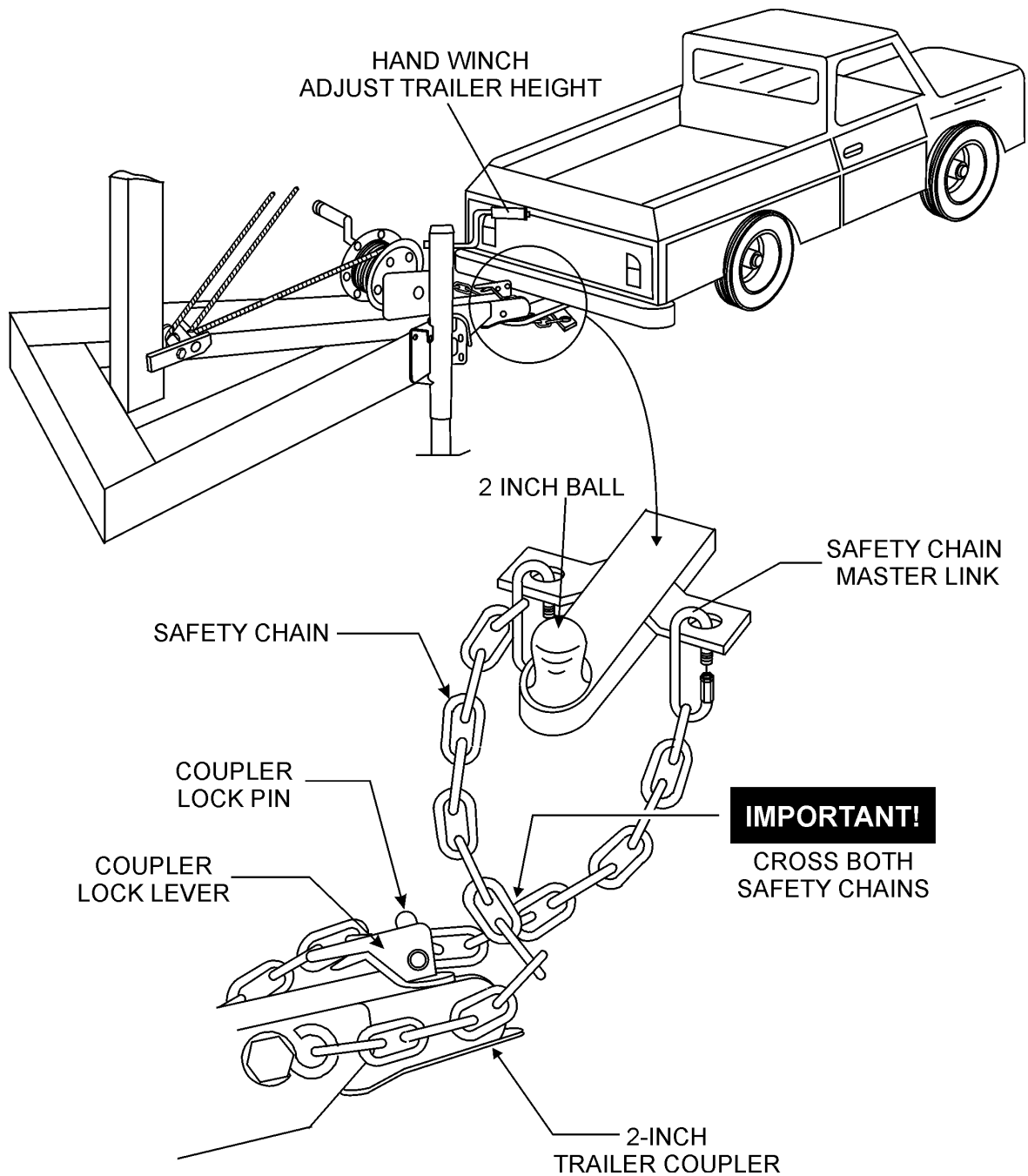


Figure 7. Safety Chains/Trailer Coupler Hook-up

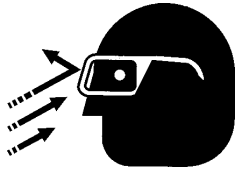
LT-12 SERIES LIGHT TOWER — TRAILER SAFETY GUIDELINES

Tires/Wheels/Lug Nuts

Tires and wheels are a very important and critical components of the trailer. When specifying or replacing the trailer wheels it is important the wheels, tires, and axle are properly matched.

! WARNING - Wheel Repair/Modification

DO NOT attempt to repair or modify a wheel. **DO NOT** install an inter-tube to correct a leak through the rim. If the rim is cracked, the air pressure in the inter-tube may cause pieces of the rim to explode (break-off) with great force and can cause serious eye or bodily injury.



Tires Wear/Inflation







Tire inflation pressure is the most important factor in tire life. Pressure should be checked cold before operation. **DO NOT** bleed air from tires when they are hot. Check inflation pressure weekly during use to insure the maximum tire life and tread wear.

Table 3 (Tire Wear Troubleshooting) will help pinpoint the causes and solutions of tire wear problems.

! WARNING - Safety Glasses Required

ALWAYS wear safety glasses when removing or installing force fitted parts. Failure to comply may result in serious injury.



TABLE 3 TIRE WEAR TROUBLESHOOTING			
WEAR PATTERN		CAUSE	SOLUTION
	Center Wear	Over Inflation	Adjust pressure to particular load per tire manufacturer.
	Edge Wear	Under Inflation	Adjust pressure to particular load per tire manufacturer.
	Side Wear	Loss of chamber or overloading.	Make sure load does not exceed axle rating. Align wheels.
	Toe Wear	Incorrect toe-in	Align wheels.
	Cupping	Out-of balance	Check bearing adjustment and balance tires.
	Flat Spots	Wheel lockup & tire skidding.	Avoid sudden stops when possible and adjust brakes.

Suspension

The leaf suspension springs and associated components (Figure 8) should be visually inspected every 6,000 miles for signs of excessive wear, elongation of bolt holes, and loosening of fasteners. Replace all damaged parts (suspension) immediately. Torqued suspension components as detailed in Table 4.

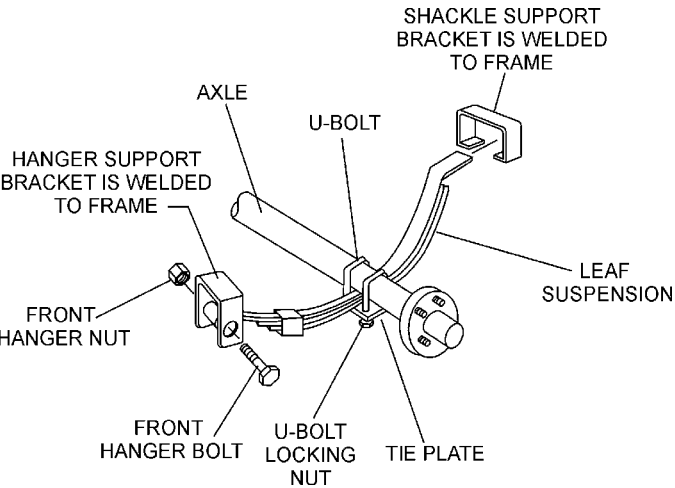


Figure 8. Major Suspension Components

LT-12 SERIES LIGHT TOWER — TRAILER SAFETY GUIDELINES

TABLE 4. SUSPENSION TORQUE REQUIREMENTS

Item	Torque (Ft.-Lbs.)
3/8" U-BOLT	MIN-30 MAX-35
7/16" U-BOLT	MIN-45 MAX-60
1/2" U-BOLT	MIN-45 MAX-50
SHACKLE BOLT SPRING EYE BOLT	SNUG FIT ONLY. PARTS MUST ROTATE FREELY. LOCKING NUTS OR COTTER PINS ARE PROVIDED TO RETAIN NUT-BOLT ASSEMBLY.
SHOULDER TYPE SHACKLE BOLT	MIN-30 MAX-50

Lug Nut Torque Requirements

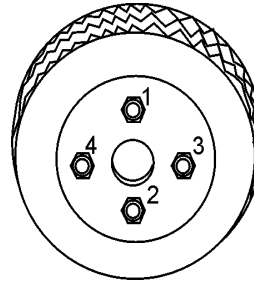
It is extremely important to apply and maintain proper wheel mounting torque on the trailer. Be sure to use only the fasteners matched to the cone angle of the wheel. Proper procedure for attachment of the wheels is as follows:

1. Start all wheel lug nuts by hand.
2. Torque all lug nuts in sequence. See Figure 9. **DO NOT** torque the wheel lug nuts all the way down. Tighten each lug nut in 3 separate passes as defined by Table 5.

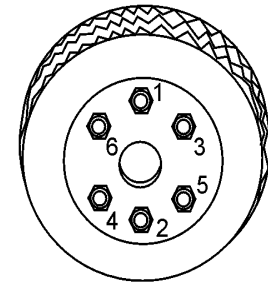
TABLE 5. TIRE TORQUE REQUIREMENTS

Wheel Size	First Pass FT-LBS	Second Pass FT-LBS	Third Pass FT-LBS
12"	20-25	35-40	50-65
13"	20-25	35-40	50-65
14"	20-25	50-60	90-120
15"	20-25	50-60	90-120
16"	20-25	50-60	90-120

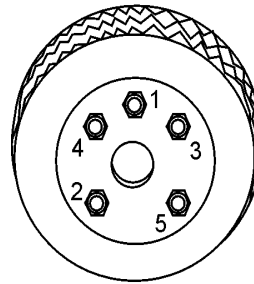
3. After first road use, retorque all lug nuts in sequence. Check all wheel lug nuts periodically.



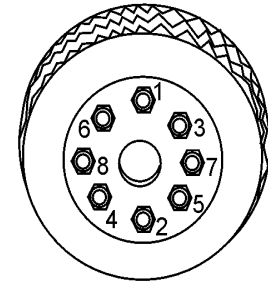
4-LUG NUTS



6-LUG NUTS



5-LUG NUTS



8-LUG NUTS

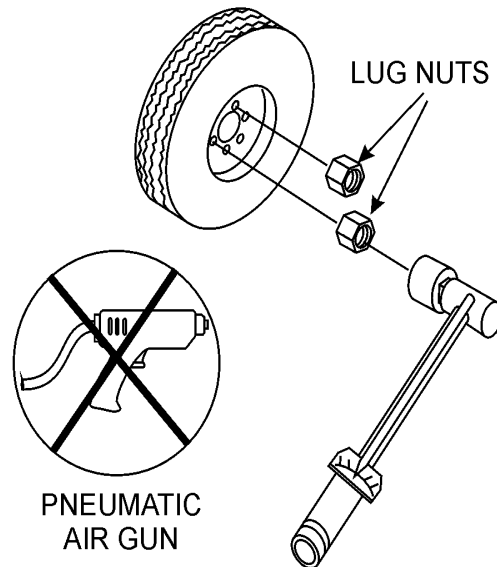
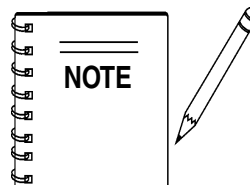


Figure 9. Wheel Lug Nuts Tightening Sequence



NEVER! use an pneumatic air gun to tighten wheel lug nuts.

LT-12 SERIES LIGHT TOWER — TRAILER WIRING DIAGRAM

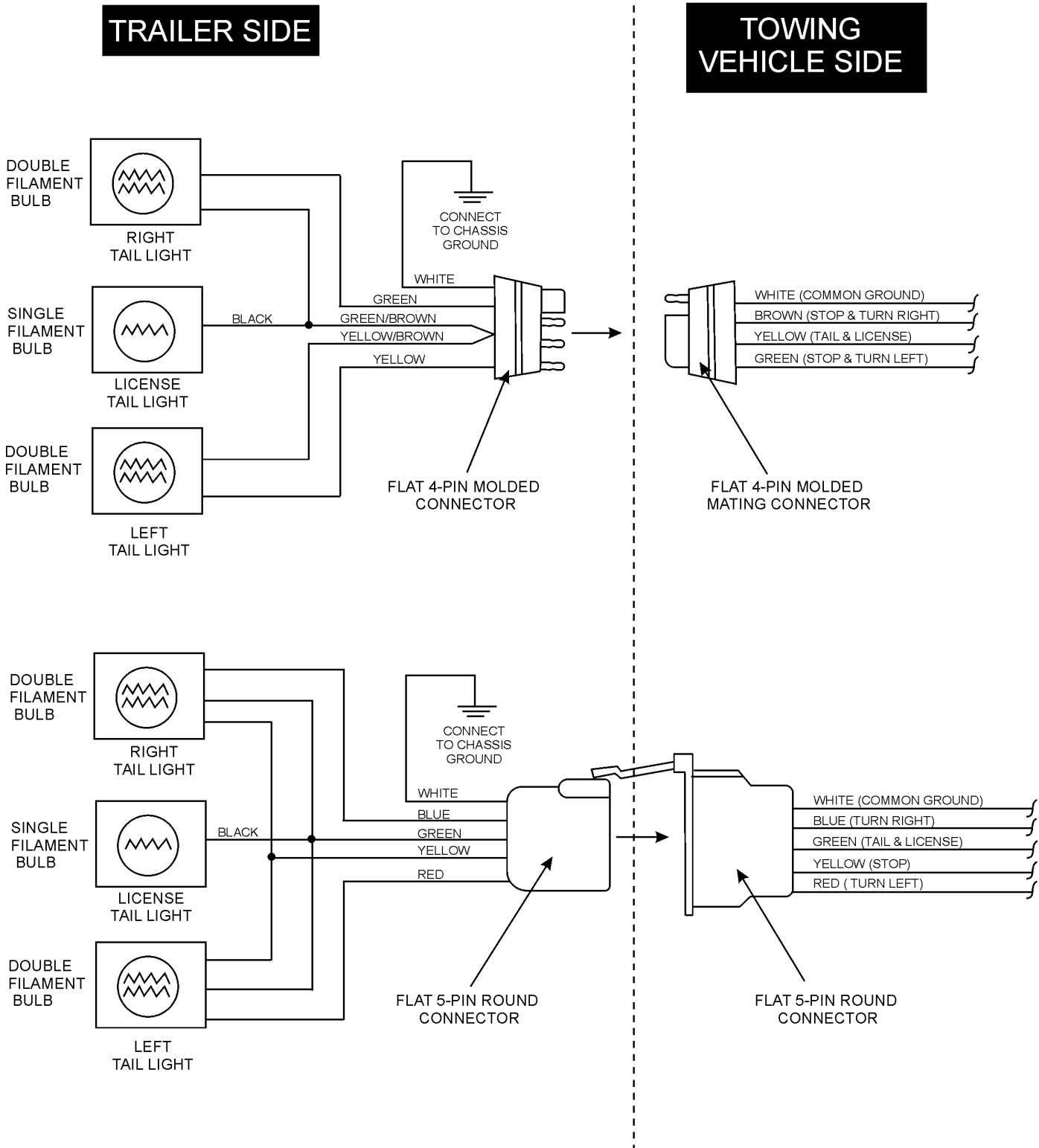


Figure 10. Typical Trailer Wiring Diagram

NOTE:
LIGHTS ARE ORIENTED FROM THE DRIVER'S SEAT

LT-12 SERIES LIGHT TOWER — INSPECTION

Before Starting

1. Read **all safety instructions** at the beginning of manual.
2. Clean the light tower, removing dirt and dust, particularly the engine cooling air inlet and air cleaner.
3. Check the air filter for dirt and dust. If air filter is dirty, replace air filter with a new one as required.
4. Check all fastening nuts and bolts for tightness.

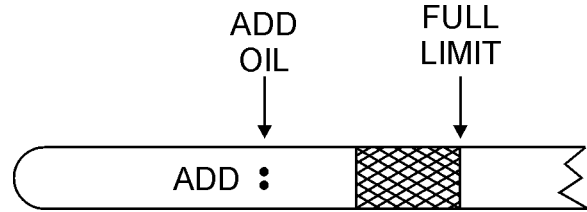


Figure 11. Dipstick

5. When checking the engine oil, be sure to check if the oil is clean. If the oil is not clean, drain the oil by removing the oil drain plug, and refill with the specified amount of oil as outlined in the **Perkins or Lombardini-Deutz Engine Owner's Manuals**. Oil should be warm before draining.

WARNING - Ventillation Requirements

Ensure adequate ventilation when operating the lighttower in enclosed areas. The engine exhaust contains noxious elements.

Indoor Installation

Exhaust gases from diesel engines are extremely poisonous. Whenever an engine is installed indoors the exhaust fumes must be vented to the outside. The engine should be installed at least two feet from any outside wall. Using an exhaust pipe which is too long or too small can cause excessive back pressure which will cause the engine to heat excessively and possibly burn the valves.

Eliminate the danger of deadly carbon monoxide gas. Remember that exhaust fumes from any gasoline or diesel engine are very poisonous if discharged in a closed area. If the light tower is installed indoors, you must make provisions for venting the engine exhaust to the outside of the building.

Engine Oil Check

1. To check the engine oil level, place the make sure the light tower is placed on secure level ground with the engine stopped.
2. Remove the **filler cap/dipstick** from its holder and wipe it clean.
3. Insert and remove the dipstick from its holder. Check the oil level shown on the dipstick.
4. If the oil level is low, add oil through the oil filler hole, **DO NOT** overfill. Fill to the normal operating level as shown on the dipstick (Figure 28). Verify that the oil level is maintained between the two notches as shown in Figure 11. Always fill with recommended type oil as listed in Table 6. Reference Table 2 for engine oil capacity.

TABLE 6. RECOMMENDED MOTOR OIL (DEUTZ ENGINES)

°C	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
°F	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122
SAE 10W																			
SAE 20W																			
SAE 30																			
SAE 40																			
SAE 10W-30																			
SAE 10W-40																			
SAE 10W-60																			

TABLE 6. RECOMMENDED MOTOR OIL (PERKINS ENGINES)

°C	-40	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	45	50
°F	-40	-31	-22	-13	-4	5	14	23	32	41	50	59	68	77	86	95	104	113	122
SAE 5W-20																			
SAE 10W-30																			
SAE 15W-40																			
SAE 20W-50																			
SAE 20																			
SAE 30																			
SAE 40																			

Other types of motor oils may be substituted if they meet the following requirements:

- API Service Classification CH-4
- API Service Classification CG-4
- API Service Classification CF-4
- ACEA Specification E3
- ACEA Specification E2

LT-12 SERIES LIGHT TOWER — INSPECTION

Fuel Check

! CAUTION - Diesel Fuel Safety

Diesel fuel and its vapors are dangerous to your health and the surrounding environment. Avoid skin contact and/or inhaling fumes. **DO NOT** smoke while refueling. **DO NOT** attempt to refuel the light tower if the engine is **hot!** or **running**.



- To check the engine fuel level, make sure the light tower is placed on secure level ground with the engine stopped.
- Lift the light tower access door (Figure 12) opposite the control panel. Set the door support latch in place to keep the door open (up).

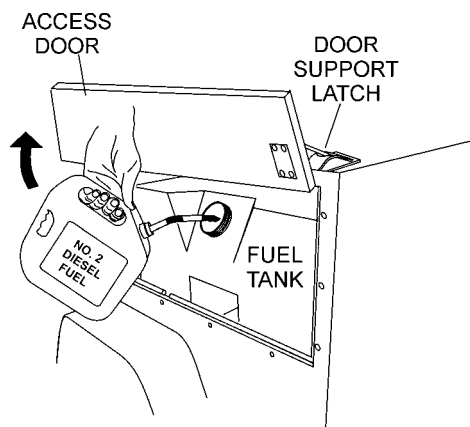


Figure 12. Adding Fuel

- Remove the fuel cap from the fuel tank as shown in Figure 12.

! CAUTION - Diesel Fuel Safety

ALWAYS fill the fuel tank with clean, fresh #2 diesel fuel. **DO NOT** fill the fuel tank beyond its capacity. **DO NOT TOP-OFF.**

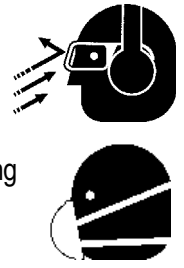
- Pay attention to the fuel tank capacity when replenishing fuel. The fuel tank cap must be closed tightly after filling. Handle fuel in a safety container. If the container does not have a spout, use a funnel. Wipe up any spilled fuel immediately.
- Wipe up any spilled fuel **immediately!**

Battery Check

! WARNING - Battery Safety

The operator **MUST** wear the appropriate protective equipment and clothing while handling the battery.

Failure to wear protective equipment or clothing could result in **SERIOUS INJURY**.



Battery - The 12-volt DC battery (Figure 13) is shipped **dry**, and will require a proper electrolyte level for operation.

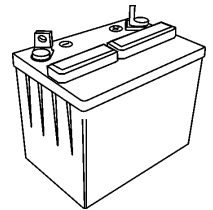


Figure 13. Battery

When servicing of the battery is required perform the following:

- A face shield and rubber gloves should be worn while handling and servicing battery's electrolyte.
- Disconnect** battery terminal clamps, and remove the battery from the generator cabinet when servicing is required.
- DO NOT** overfill the battery.

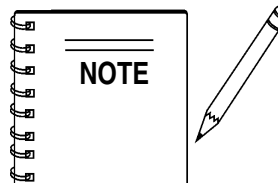
! WARNING - Battery Service Safety



Electrolyte is an acid and must be handled with caution. Servicing instructions from the electrolyte manufacturer must **ALWAYS** be followed to ensure safety. Serious injury can result from careless handling and noncompliance to safety handling instructions.

Overfilling the battery may cause the electrolyte to overflow resulting in corrosion to nearby components. Immediately wash off any spilled electrolyte (battery acid).

Additionally, when connecting the positive (+) cable to the battery's positive (+) terminal post, **DO NOT** allow contact of the wrench or any metallic part to come in contact with the battery's negative (-) terminal post. This may result in an electrical short circuit or an explosion.



Use only **distilled** water in the battery. Tap water can **reduce** the operating life of the battery.

LT-12 SERIES LIGHT TOWER — INSPECTION

Coolant (Ethylene Glycol [Green] / Water — 50/50 mix)

Use only drinkable tap water. If hard water or water with many impurities is used, the inside of the engine and radiator may become coated with deposits and cooling efficiency will be reduced.

An anticorrosion additive added to the water will help prevent deposits and corrosion in the cooling system. See the engine manual for further details.

! WARNING - Radiator Burn Hazard

If adding coolant/antifreeze mix to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. The possibility of hot! coolant exists which can cause severe burns.



Day-to-day addition of coolant is done from the recovery tank. When adding coolant to the radiator, **DO NOT** remove the radiator cap until the unit has completely cooled. See Table 7 for engine and radiator, coolant capacities. Make sure the coolant level in the recovery tank is always between the "H" and the "L" markings.

TABLE 7. COOLANT CAPACITY

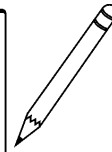
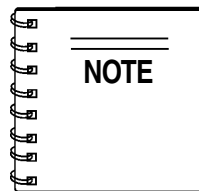
Engine Type	Coolant Capacity
Perkins 103-10	5 qt. (4.7 Liters)
Lombardini LDW 1003	5.18 qt. (4.9 Liters)
DEUTZ F3M1008F	5.18 qt. (4.9 Liters)

Operation Freezing Weather

When operating in freezing weather, be certain the proper amount of antifreeze (Table 8) has been added.

TABLE 8. ANTI-FREEZE OPERATING TEMPERATURES

Vol % Anti-Freeze	Freezing Point		Boiling Point	
	°C	°F	°C	°F
40	-24	-12	106	222
50	-37	-34	108	226



When the antifreeze is mixed with water, the antifreeze mixing ratio **must be** less than 50%.

Cleaning the Radiator

The engine may overheat if the radiator fins become overloaded with dust or debris. Periodically clean the radiator fins with compressed air. Cleaning inside the machine is dangerous, so clean only with the engine turned off and the **negative** battery terminal disconnected.

Air Cleaner

Periodic cleaning/replacement is necessary. Inspect it in accordance with the **Perkins, Lombardini or Deutz Engine Owner's Manuals**.

Fan Belt Tension

A slack fan belt may contribute to overheating, or to insufficient charging of the battery. Inspect the fan belt for damage and wear and adjust it in accordance with the **Perkins, Lombardini or Deutz Engine Owner's Manuals**.

The fan belt tension is proper if the fan belt bends 10 to 15 mm (Figure 14) when depressed with the thumb as shown below.

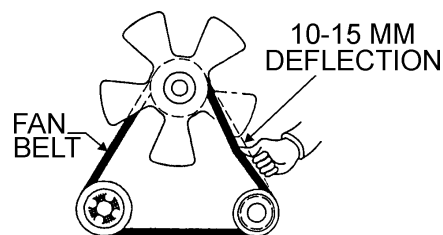


Figure 14. Fan Belt Tension

! WARNING - Rotating Parts Hazard

NEVER place hands near the belts or fan while the engine is running.



LT-12 SERIES LIGHT TOWER — INSPECTION

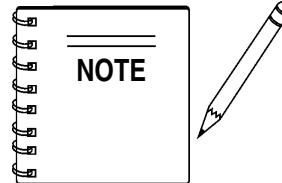
WARNING - Respiratory Hazard

The engine's exhaust contains harmful emissions. ALWAYS ventilate the exhaust when operating inside tunnels, excavations or buildings. Direct exhaust away from nearby personnel.



Before starting the engine perform the following:

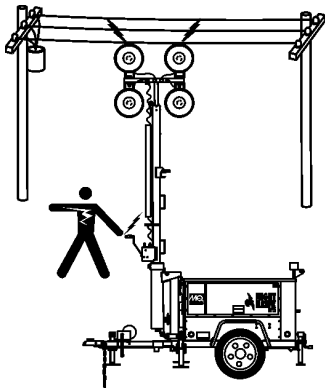
1. Be sure to **disconnect the electrical load** and switch the main circuit breaker and all lamp (4) circuit breakers to the **OFF** position prior to starting the engine.
2. **NEVER** start the engine with any circuit breakers in the **ON** position.
3. Make sure light tower is placed on **secure level ground** with chock blocks underneath each wheel to prevent the light tower from rolling.
4. Outriggers have been fully extended to prevent the trailer from tipping.
5. All tower mast sections have been raised to the desired height.
6. Bottom tower mast is locked in place.
7. Light tower trailer support stands have been positioned properly and the trailer is level.
8. Flood lights have been adjusted to desired position.
9. Chocked blocks have been positioned under each wheel to prevent trailer from rolling.
10. Flood lights **DO NOT** interfere with any overhead obstructions.
11. Flood light power cables have been plugged into the appropriate receptacles (J1-J4) on the T-Bar assembly.
12. Light tower trailer frame has been grounded correctly.



DO NOT attempt to start the engine until all the conditions referenced in steps 1 through 12 have been met.

DANGER - Overhead Obstruction Danger

ALWAYS make sure the area above Light tower is open and clear of overhead power lines and other obstructions. The tower extends in excess of 30 ft. (9 meters). Contact with overhead powerlines or other obstructions could result in equipment damage, **Serious Injury or Death!**



LT-12 SERIES LIGHT TOWER — STARTUP PROCEDURES

Starting the Engine

The Night-Hawk LT-12 Series Light Tower is available with two types of engines (Perkins or Lombardini/Deutz). The engine starting procedure contained within this manual will address both engines..

Starting the Engine (Perkins Engines)

1. **Open** the access panel door on the right-side of the light tower (opposite the fuel tank). Set the door latch in place to hold the door open (up)
2. Insert the ignition key into the ignition switch (Figure 15). Turn the ignition key clockwise to the **ON** position. The pre-heat indicator lamp will be lit, wait for this indicator lamp to go **OFF**. When the lamp goes **OFF** this indicates that the glow plugs have been pre-heated and the engine can now be started.

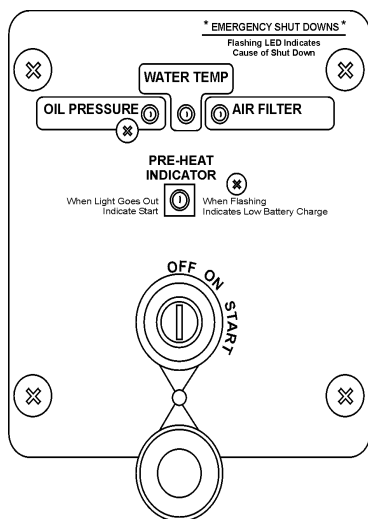


Figure 15. Perkins Ignition Switch

3. Continue turning the ignition key in a clockwise direction to the **START** position, when the engine has started, release the key.
4. Before placing the light tower into actual operation, let it run for 3-5 minutes. Listen of any abnormal sounds or smells that would be associated with a defective light tower. If any abnormal conditions occur, shut-down the light tower and correct the problem.

Starting the Engine (Lombardini/Deutz Engines)

1. **Open** the access panel door on the right-side of the light tower (opposite the fuel tank). Set the door latch in place to hold the door open (up)
2. Insert the ignition key into the ignition switch (Figure 16). Turn the ignition key clockwise one click to the **ON** position. The pre-heat indicator lamp will be lit, wait for this indicator lamp to go **OFF**. When the lamp goes **OFF** this indicates that the glow plugs have been pre-heated and the engine can now be started.

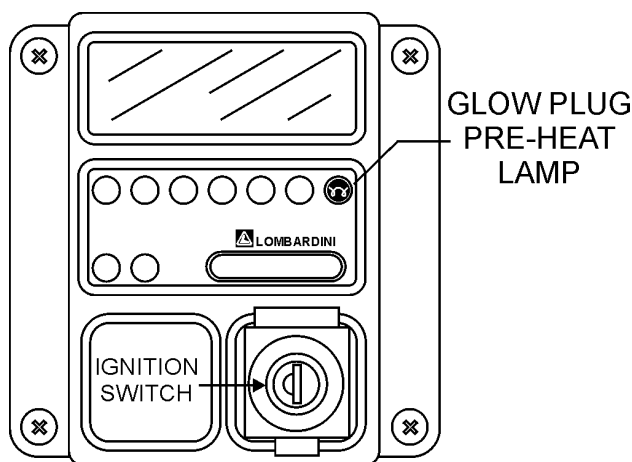


Figure 16. Lombardini/Deutz Ignition Switch

3. Continue turning the ignition key all the way clockwise, when the engine has started, release the key.
4. Before placing the light tower into actual operation, let the engine run for 3-5 minutes. Listen of any abnormal sounds or smells that would be associated with a defective light tower. If any abnormal conditions occur, shut-down the light tower and correct the problem.

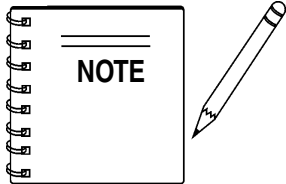
LT-12 SERIES LIGHT TOWER — SHUTDOWN PROCEDURES

Normal Shut-down

1. If a load is attached to the generating set of the light tower, **remove the load**.
2. Set CB-1 thru CB-4 on the control panel to the **OFF** position.
3. Place the **MAIN** circuit breaker (Figure 5, Item 4) on the control panel to the **OFF** position.
4. Wait a few seconds and observe that flood all floodlights are **OFF**.
5. Let the engine idle for a few minutes with no load.
6. Turn the ignition key to the **OFF** position. Store key in a safe location.
7. Lower light tower mast and place in stow position as outlined in the Pre-Setup section of this manual.
8. Place outriggers in tow position, and remove chock blocks.
9. Store light tower in a clean, dry location out of the reach of children and bystanders.

Emergency Shut-down

1. Turn the ignition key to the **OFF** position.



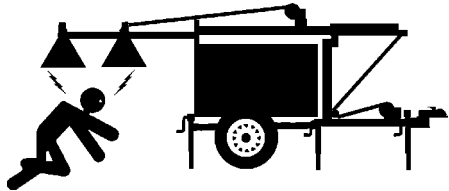
Allow flood lights to cool (15 minutes) if service or removal of bulb is required.

LT-12 SERIES LIGHT TOWER — MAST OPERATION

! DANGER - Overhead Obstruction Danger

ALWAYS make sure the area above Light tower is open and clear of overhead power lines and other obstructions. The mast extends in excess of 30 ft. (9 meters). Contact with overhead powerlines or other obstructions could result in equipment damage, ***Serious Injury or Death!***

DO NOT stand behind the trailer while the mast is being raised or lowered. Serious Injury could result if the mast falls down.



Outriggers and Support Stands

1. Make sure both outriggers are extended. To extend the outriggers, pull the locking pin on the outrigger and hold while sliding out the outrigger assembly.
2. As soon as the pin clears the travel position hole, release it and continue sliding out the outrigger. The pin must snap into the outrigger locking hole in the extended position.
3. After extending all outriggers, rotate all trailer **jack stands** into the foot down position, then turn the crank handle on the **jack stands** clockwise to lower it and level the light tower.
4. Check behind the light tower and make sure all personnel and objects are clear of the mast.

Raising Mast (Lower Mast Section)

Follow the steps below to raise the lower mast:

1. To release the mast from the support stand locking cradle, **PULL** the large cradle locking pin (see Figure 3, item 9). This will unlock the mast from the horizontal position.
2. Remove the bottom mast quick release locking pin (see Figure 3, Item 17) before raising tower to the vertical position.
3. To place the mast in the vertical position, **TURN** the vertical winch hand lever (Figure 3, item 16) clockwise until the mast is pointing upwards at 90 degrees.
4. Once the mast in the vertical position and the mast lock captures the swivel base tab, insert the quick release locking pin to prevent the mast from falling.

Raising Mast (Top and Center Tower Sections)

Once the tower mast has been locked into its vertical position, the top and center tower sections can now be raised. These two tower sections allow the flood lights to be extended upwards in excess of 30 ft. Perform the following steps when extending the floodlights:

1. Locate the "vertical mast extension hand winch", see Figure 3, Item 2.
2. Turn the vertical mast extension hand winch lever clockwise, and observe that the flood lights begin to climb upward.
3. Continue turning the hand winch lever in the clockwise direction until the desired height has been reached.
4. Release the hand winch lever, this winch is of the self-locking type. The tension on the cable will keep the mast sections in place.

Lowering Mast (Top and Center Tower Sections)

1. Turn the vertical mast extension hand winch lever counter-clockwise, and observe that the flood lights begin to drop downward.
2. Continue turning the hand winch lever counter-clockwise until the top and center mast sections have been fully retracted (slack in the cable).

Lowering Mast (Lower Lower Section)

1. Remove the quick release locking pin to allow the mast section to be lowered to the horizontal section. Hold the locking pin open until the swivel base tab clears the lock.
2. Turn the vertical mast hand winch lever counter-clockwise, and observe that bottom tower mast begins to approach the horizontal position.
3. Continue turning the vertical hand winch lever in the counter-clockwise direction. As the lower tower mast approaches the locking cradle, pull the tower release pin to allow the tower mast to rest in the cradle.
4. Once the lower mast is resting in the cradle of the tower support stand, align the hole on the mast with the hole on the cradle and insert locking pin.

LT-12 SERIES LIGHT TOWER — OPERATION

Turning On the Flood Lights

The **Main Circuit Breaker** (25 amps), and 4 **floodlight circuit breakers** (10 amps each) are located on the upper control panel (Figure 20). Please note that there is one 10 amp circuit breaker for each floodlight.

1. Place the **Main circuit breaker** (Figure 17) on the control panel to the **ON** position.
2. Set CB-1 on the control panel to the **ON** position.
3. Wait a few minutes for the ballast to activate. Observe that flood light #1 is **ON**.
5. Repeat steps 2 and 3 for flood lights 2 through 4 (CB-2 through 4).
6. If all the **flood light circuit breakers** are in the **ON** position (up), then all of the lights should be on.
7. If any of the flood lights are not **ON** refer to the troubleshooting section of this manual.
8. **CLOSE** all cabinet doors.

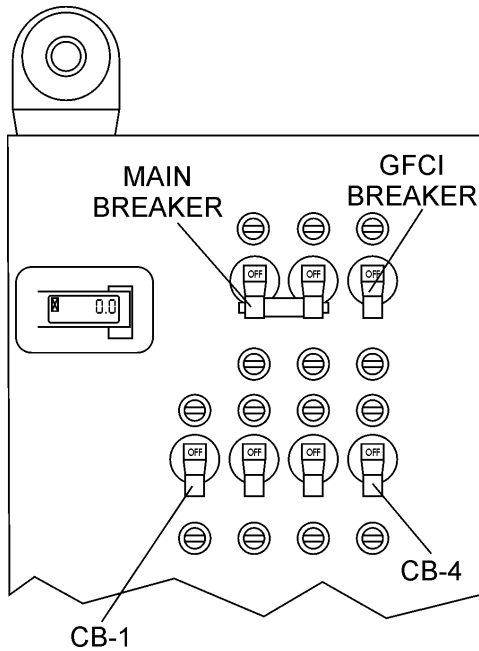
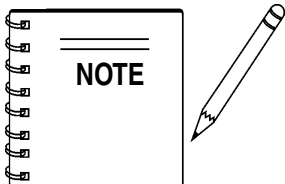


Figure 17. Control Panel Circuit Breakers



NEVER operate the light tower with the engine compartment doors open. Operation with the doors open may cause insufficient cooling to the unit, and damage may result.

Applying an External Load

The Night-Hawk LT-12 Series Light Tower is available with two auxiliary output receptacles (Figure 18). The upper most receptacle (twist-lock) located at the front of the light tower can provide 240 VAC at 25 amps. The bottom receptacle is a GFCI receptacle which can supply 120 VAC at 15 amps.

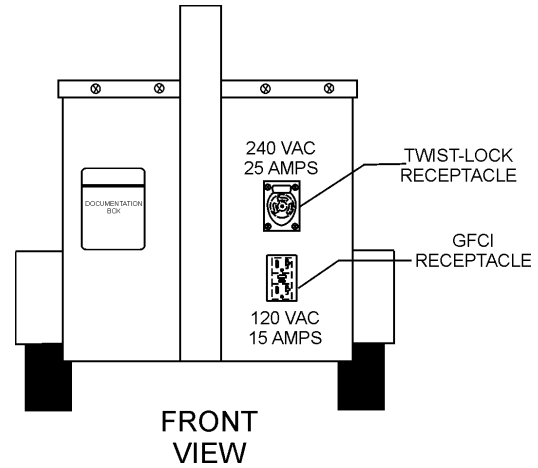


Figure 18. 120/240 VAC Output Receptacles

! DANGER - Electric Shock Hazards

NEVER grab or touch a live power cord with wet hands, the possibility exists of electrical shock, electrocution, and even death!

WET HANDS
POWER CORD (POWER ON)

Testing the 120 VAC GFCI Receptacle

Pressing the **reset** button resets the GFCI receptacle after being tripped. Pressing the "**Test Button**" (See Figure 19) in the center of the receptacle will check the GFCI function. Both receptacles should be tested at least once a month.

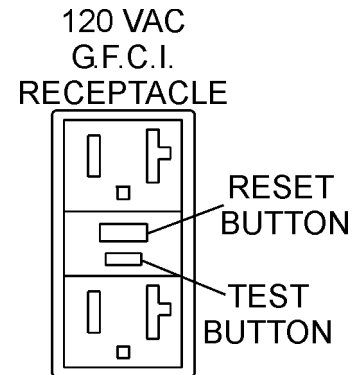


Figure 19. GFCI Test Button

LT-12 SERIES LIGHT TOWER — MAINTENANCE

Use Table 9 shown below as a general checklist to be performed on a daily basis. For more detailed maintenance refer to the Perkins or Lombardini/Deutz engine service manuals.



TABLE 9. INSPECTION / MAINTENANCE		10 Hrs DAILY	200 Hrs	500 Hrs	1000 Hrs
ENGINE	Check Engine Fluid Levels	X			
	Check Fuel Filter	X			
	Check Air Cleaner Dust Indicator (if equipped)	X			
	Check for Leaks/Visual Walk Around	X			
	Check for Loosening of Parts	X			
	Replace Engine Oil and Filter *1		X		
	Service Battery		X		
	Clean Unit, Inside and Outside		X		
	Change Fuel Filter *2			X	
	Clean Radiator and Check Coolant Protection Level			X	
	Replace Air Filter Element				X
	Test Thermostats				X
	Check all Hoses and Clamps/Flush Radiator				X
	Clean Inside of Fuel Tank				X
GENERATOR	Measure Insulation Resistance Over 3M ohms		X		

*1 Replace engine oil and filter at 100 hours, first time only.

*2 Replace fuel filter at 250 Hours, first time only.

LT-12 SERIES LIGHT TOWER — MAINTENANCE

Check Cable Wear

The wire rope (cable) that raises and extends the mast is a very important part of the light tower. There is one cable/hand winch system, located on the tongue of the trailer, that raises and extends the light tower mast. There is a second cable/hand winch system located on the mast that serves to raise and lower the two extendable sections of the mast.

! DANGER - Light Tower Cable System Safety

Wire rope (cable) will fail if it is worn, frayed, misused, crushed, kinked or damaged in any way. **ALWAYS** check the cables and pulleys for any abnormalities before use.

DO NOT use it if there is even the slightest cause for concern and replace any damaged cables or pulleys **immediately**.

Servicing the Mast Raise/Lower Cable System:

To replace any components in the mast raise/lower cable system, use the following steps (Reference Figure 20):

1. Lower the mast to the horizontal resting position.
2. Inspect the cable clamps, pulleys, and other components for worn or damaged parts.
3. Disconnect the cable from the ball socket pin and remove from the mast pulley and cable sheave. Detach the cable from the hand winch as necessary.
4. Replace the pulley and the cable as needed.
5. Re-thread the cable through the pulley and reattach the cable to the ball socket pin.
6. Raise and lower the mast several times to verify correct operation.

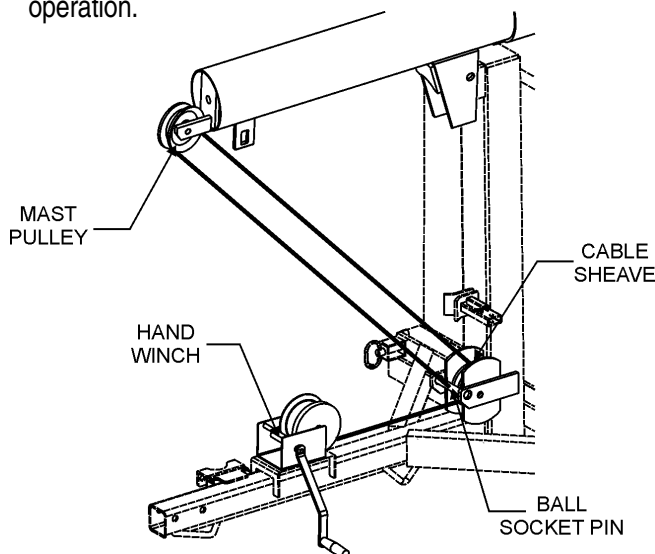


Figure 20. Mast Raise/Lower Cable System

Servicing the Mast Extension Cable System:

To replace the cable in the mast extension cable system, use the following steps (Reference Figure 21):

1. Lower the mast to the horizontal resting position.
2. Inspect the cable clamps, pulleys, and other components for worn or damaged parts. If either of the cables on the mast needs to be replaced, they should both be replaced at the same time.
3. Disassemble the mast by disconnecting the cables from the mast and sliding the sections apart. The lower cable can be disconnected from the winch.

! WARNING - Mast Service Safety

The mast sections are heavy and awkward to handle. Use proper lifting devices and procedures when servicing the mast and its components.

4. There are two pulleys in the mast raise/lower cable system. They should be removed, and replaced if worn or damaged, as they can cause premature cable failure if they are in poor condition.
5. Reassemble the mast extension cable system by connecting the cable to the bottom of the upper mast and sliding the upper mast into the opening of the center mast. Connect the second cable to the bottom of the center mast and slide the center mast into the opening of the lower mast, observing proper lifting techniques.
6. Route the upper mast cable through the center mast pulley and connect the free end of the cable to the lower mast ankle shackle. Route the center mast cable through the lower mast pulley and connect the free end of the cable to the hand winch at the bottom of the lower mast.
7. Raise, extend, retract and lower the mast several times to verify correct operation.

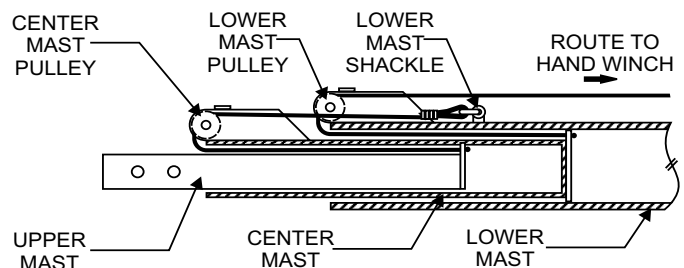


Figure 21 Mast Extension Cable System

LT-12 SERIES LIGHT TOWER — MAINTENANCE

General Inspection

Prior to each use, the generating set should be cleaned and inspected for deficiencies. Check for loose, missing or damaged nuts, bolts or other fasteners. Also check for fuel or oil leaks.

Air Cleaner

Every **50 hours**: Check dust indicators on control panel. If light is **ON**, clean the air cleaner element.

1. Un-latch the holding clips and take out the air cleaner element.
2. Clean the inside of the body and cover using a damp cloth.
3. Blow dry with compressed air (0.69Mpa {7kgf.cm², 99.4 PSI} maximum) against the side of the element along the pleats. Then blow dry against outside along the pleats, then against inside again.
4. Remove one seal each time the element is cleaned.
5. Replace the outer element after cleaning it 6 times or after one year. Replace the outer element if indicator is red even after cleaning it.
6. If seal washer is damaged or the threads of wing nut are damaged, replace.
7. Remove evacuator valve and clean it with compressed air. Reinstall.

Fuel Addition

Add diesel fuel (the grade may vary according to season and locations). Always pour through the mesh filter.

Removing Water from the Tank

After prolonged use, water and other impurities accumulate in the bottom of the tank. Occasionally remove the drain cock and drain the contents. During cold weather, the greater the empty volume inside the tank, the easier it is for water to condense. This can be reduced by always keeping the tank as full as possible.

Air Removal

If air enters the fuel injection system of a diesel engine, starting becomes impossible. After running out of fuel, or after disassembling the fuel system, bleed the system according to the following procedure.

To restart after running out of fuel, squeeze the fuel primer bulb to pump fuel into the engine. This unit is equipped with an automatic air bleeding system.

Service Daily

If engine is operating in very dusty and dry grass conditions, a clogged air cleaner will result in high fuel consumption, loss of power and excessive carbon buildup in the combustion chamber.

Cleaning the Fuel Strainer

Clean the fuel strainer if it contains dust or water. Remove dust or water in the strainer cap and wash it in diesel. Securely fasten the fuel strainer cap so that fuel will not leak. Check the fuel strainer every 200 hours of operation or once a month.

Check Oil Level

Check the crankcase oil level prior to each use, or when the fuel tank is filled. Insufficient oil may cause severe damage to the engine. Make sure the generator is level. The oil level must be between the two notches on the dipstick as shown in Figure 14.

LT-12 SERIES LIGHT TOWER — MAINTENANCE

WARNING - Radiator Burn Hazard

Allow engine to **cool** when flushing out radiator. Flushing the radiator while **hot!** will damage radiator. In addition the possibility of **hot!** coolant exists which can cause severe burns.



Flushing Out Radiator and Changing Coolant

1. Stop the engine and allow to cool. Tighten valve of the corrosion resistor (if equipped).
2. Turn water filler cap slowly and remove it.
3. Prepare a container to catch the coolant, then open drain plug of the radiator or heat exchanger and drain plug of the engine, and drain the coolant.
4. After draining the coolant, close drain plugs and fill with tap water.
5. When the water level is near the mouth of the water filler, open drain plugs and start the engine, and run at low idling. Keep the engine running at low idling and flush the radiator for about 10 minutes.
6. Adjust the flow of the water flowing in and draining out to ensure that the radiator is always full during the flushing operation. While flushing water through the system, watch carefully the water inlet hose does not come out of the radiator filler port.
7. After flushing, stop the engine, open drain plug and drain the water, then close drain plugs.
8. After draining the water, flush the system with a flushing agent. See instructions on flushing agent label.
9. After flushing, open drain plugs and drain out all the water, then close drain plugs and add tap water so the water level is near the mouth of the water filler.
10. When the water level is near the mouth of the water filler, open drain plugs and start the engine, run at low idling and continue to flush the system until clean water comes out. Adjust the flow of the water flowing in and draining out to ensure the radiator is always full during the flushing operation.
11. When clean water comes out, stop the engine, drain all the water, then close drain plugs.
12. Remove the corrosion resistor (if equipped) and open valve.
13. Supply water until it flows over the water filler.

14. Drain the water inside reserve tank, clean the inside of the reserve tank, then fill with coolant/water mixture to between the full and low lines.
15. Stop the engine, wait for 3 minutes, add tap water until the water level reaches near the water filler port, then tighten the radiator cap.

Changing Oil

1. Make sure the oil is cool before changing.
2. Set a container directly under the drain plug of the oil pan. Loosen the drain plug slowly.
3. Check the drained oil for excessive metal particles or foreign material. Contact the distributor if there is metal particles or foreign material.
4. Using a filter wrench, turn filter cartridge to the left to remove it. If the filter cartridge is filled with a large amount of oil, wait 10 minutes or so before removing. Make sure there is no old gasket stuck on the filter holder.
5. Tighten drain plug. Clean the filter holder, fill the new filter cartridge with clean engine oil, coat the packing and thread of the new filter cartridge with engine oil, then install it to the filter holder. Tighten until the gasket surface contacts the seal surface of the filter holder, then tighten it a further 3/4 to 1 turn.
6. Add engine oil through oil filler until the oil level is between the H and L marks on the dipstick.
7. Run the engine at idling for a short time, then stop the engine. Recheck the oil level and fill as necessary.

LT-12 SERIES LIGHT TOWER — MAINTENANCE

Replacing Fuel Filter

1. Set the container under the filter cartridge to catch fuel.
2. Using a filter wrench, turn the filter cartridge to the left to remove it.
3. Clean the filter holder, fill the new filter cartridge with fuel, coat the packing surface of the filter cartridge with engine oil, then install the cartridge to the filter holder.
4. When installing, tighten until the packing surface contacts the seal surface of the filter holder then tighten a further 2/3 of a turn. If the filter cartridge is tightened too much, the packing will be damaged and will cause fuel leakage. Fuel leakage will occur if the filter cartridge is not tightened enough. Always tighten to the correct angle.
5. Squeeze the fuel primer bulb to pump fuel back into the engine.
6. Replace Corrosion resistor cartridge (if equipped)
7. Screw in valves at the top of the corrosion resistor.
8. Using a filter wrench, turn the cartridge to the left to remove it.
9. Coat the seal surface of the new cartridge with engine oil and install it to the filter holder.
10. Tighten until the packing surface contacts the seal surface of the filter holder, then tighten a further 2/3 of a turn.
11. Open valves.

Light Tower Storage:

For storage of the generator for over 30 days, the following is required:

- Fill the fuel tank completely. Treat with fuel stabilizer if necessary.
- Completely drain oil from the crankcase and refill if necessary with fresh oil.
- Clean the entire light tower, internal and external.
- Disconnect the negative terminals of the battery and cover it, or remove it from the generator and store it separately.
- If the ambient temperature is expected to drop below 0°C, add antifreeze to the radiator.
- Cover the light tower and store in a clean, dry place away from children and non-qualified personnel.

Removal From Long Term Storage:

- Apply oil to the engine valve and rocker arms, and examine the operating condition of the valves.
- Change the oil in engine oil pan.
- Replace all the filters.
- Flush the inside of the cooling system.
- Drain the water from the fuel tank and bleed the air from the fuel system.
- If the engine has not been started for more than one year, contact your Perkins or Lombardini/Deutz distributor to have engine overhauled.

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (GENERATOR)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosis based on the Generator Troubleshooting (Table 10) information shown below and on the following page. If the problem cannot be remedied, please leave the unit just as it is and consult our company's business office or service plant.

TABLE 10. GENERATOR TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
No Voltage Output	Is wiring connection loose?	Check wiring and repair.
	Is voltage regulator defective?	Replace if necessary.
	Defective rectifier?	Check and replace.
Low Voltage Output	Is engine speed correct?	Turn engine throttle lever to "High".
	Is wiring connections loose?	Check wiring and repair.
	Is voltage regulator defective?	Replace if necessary.
High Voltage Output	Is wiring connections loose?	Check wiring and repair.
	Is voltage regulator defective?	Replace if necessary.
Circuit Breaker Tripped	Short Circuit in load?	Check load and repair.
	Over current?	Confirm load requirements and reduce.
	Defective circuit breaker?	Check and replace.
Engine fails to start and starter does not rotate	Dead battery?	Replace battery.
	Defective ignition switch	Replace ignition switch.
	Defective starter?	Replace starter.
	Burned fuse?	Replace fuse.
Engine fails to start and starter does rotates	Broken pre-heat circuit?	Check pre-heat circuit
	No fuel?	Add fuel (No. 2 diesel fuel)
	Defective wiring?	Check wiring?

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (ENGINE)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, please take a remedial action following the diagnosis based on the Engine Troubleshooting (Table 11) information shown below and on the following page. If the problem cannot be remedied, please leave the unit just as it is and consult our company's business office or service plant.

TABLE 11. ENGINE TROUBLESHOOTING

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine does not start.	No fuel?	Replenish fuel.
	Air in the fuel system?	Bleed system.
	Water in the fuel system?	Remove water from fuel tank.
	Fuel pipe clogged?	Clean fuel pipe.
	Fuel filter clogged?	Clean or change fuel filter.
	Excessively high viscosity of fuel or engine oil at low temperature?	Use the specified fuel or engine oil.
	Fuel with low cetane number?	Use the specified fuel.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Incorrect injection timing?	Adjust.
	Fuel cam shaft worn?	Replace.
	Injection nozzle clogged?	Clean injection nozzle.
	Injection pump malfunctioning?	Repair or replace.
	Seizure of crankshaft, camshaft, piston, cylinder liner or bearing?	Repair or replace.
	Compression leak from cylinder?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.
	Improper valve timing?	Correct or replace timing gear.
Piston ring and liner worn?	Replace.	
Excessive valve clearance?	Adjust.	
Starter does not run.	Battery discharged?	Charge battery.
	Starter malfunctioning?	Repair or replace.
	Key switch malfunctioning?	Repair or replace.
	Wiring disconnected?	Connect wiring.

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (ENGINE)

TABLE 11. ENGINE TROUBLESHOOTING (CONTINUED)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Engine revolution is not smooth.	Fuel filter clogged or dirty?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Fuel leak due to loose injection pipe retaining nut?	Tighten nut.
	Injection pump malfunctioning?	Repair or replace.
	Incorrect nozzle opening pressure?	Adjust.
	Injection nozzle stuck or clogged?	Repair or replace.
	Fuel over flow pipe clogged?	Clean.
	Governor malfunctioning?	Repair.
Either white or blue exhaust gas is observed.	Excessive engine oil?	Reduce to the specified level.
	Piston ring and liner worn or stuck?	Repair or replace.
	Incorrect injection timing?	Adjust.
	Deficient compression?	Adjust top clearance.
Either black or dark gray exhaust gas is observed.	Overload?	Lessen the load.
	Low grade fuel used?	Use the specified fuel.
	Fuel filter clogged?	Clean or change.
	Air cleaner clogged?	Clean or change.
	Deficient nozzle injection?	Repair or replace the nozzle.
Deficient output.	Incorrect injection timing?	Adjust.
	Engine's moving parts seem to be seizing?	Repair or replace.
	Uneven fuel injection?	Repair or replace the injection pump.
	Deficient nozzle injection?	Repair or replace the nozzle.
	Compression leak?	Replace head gasket, tighten cylinder head bolt, glow plug and nozzle holder.

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (LAMPS)

Practically all breakdowns can be prevented by proper handling and maintenance inspections, but in the event of a breakdown, use Table 12 shown below and the Troubleshooting Guide as a basic guideline for troubleshooting lamp malfunctions. If the problem cannot be remedied, consult our company's business office or service plant.

TABLE 12. TROUBLESHOOTING LAMPS

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Lamp will not start.	Lamp Burned Out?	Test the lamp in a fixture which is operating properly. Replace as necessary.
	Lamp Loose in Socket?	Inspect lamp base to see if there is arcing at center contact button. Tighten lamp snugly. Check socket for damage. Replace if defective.
	Floodling Plugs Not Tight?	Check plug and receptacle. Tighten if loose.
	Defective Ballast?	Interchange ballast plugs in generator enclosure. if lamp starts, replace ballast. Check ballast wiring against diagram. Check for swollen capacitor, charred wiring, core and coil or other signs of excessive heat.
	Low Voltage?	Check line voltage at ballast input. Voltage should be within 10% of name plate rating when operating at normal load. Increase supply voltage or remove external load.
	Improper Ballast?	Proper HID lamps will perform erratically or fail to start on an improper ballast. The ballast name plate data must agree with the line voltage and lamp used. Improper ballast causes lamp failure. Note: Mercury lamps of the same wattage will operate properly on Metal Halide ballasts.
	Improper Lamp Operating Position (Metal Halide only)?	Operating position should agree with the lamp tech. A BU-HOR lamp can be operated base up vertical to and including the horizontal and a BD can be operated base down vertical to, approaching, but not including the horizontal. A lamp operated beyond the specified position may not start.
	Lamp has been Operating: Cool Down Time Insufficient?	HID lamps (High Pressure Sodium, Metal Halide, Mercury Vapor) require from 4 to 8 minutes cool-down time before restarting. Switch off breaker and allow lamp to cool.
Lamp flickers and goes out intermittent or cycling.	Improper Ballast?	Improper ballasting can cause flickering or erratic operation. In the start-up period the lamp may ignite, start to warm-up and then extinguish (cycle).
	New Lamp?	Under certain conditions new lamps may "cycle". Usually after 3 tries to start at 30 to 60 second intervals, lamps will stabilize and operate satisfactorily.
	Defective Lamp?	Replace lamp.

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (LAMPS)

TABLE 12. TROUBLESHOOTING LAMPS (CONTINUED)

SYMPTOM	POSSIBLE PROBLEM	SOLUTION
Lamp starts slowly (ARC does not strike when switch is first turned on)	Defective Lamp?	Lamp may glow for extended period of time. Replace after checking voltage and ballast.
Circuit breaker trips on lamp start-up	Short Circuit or Ground?	Check wiring against diagram. Check for shorts or ground.
Lamp light output low	Normal Lamp Depreciation?	Replace Lamp.
	Dirty Lamp or Fixture?	Clean lamp and fixture.
	Defective Ballast?	Interchange ballast plugs in generator enclosure. If lamp returns to normal light output, replace ballast. Check for swollen capacitors, charred wiring, core and coil, or other signs of excessive heat.
	Wrong Voltage?	Check voltage at ballast input. Voltage should be within 10% of nameplate rating. Check wiring connections for voltage loss. Check socket contact point.
	Improper Ballast?	Check ballast nameplate against lamp data.
Lamp colors different.	Normal Lamp Depreciation?	Lamp output and brightness decreases and color changes slightly as lamps age. Spot replacement with new lamps may cause noticeable differences in lamp colors. Group replacement minimizes color differences.
	Dirty Fixture?	Dirty fixtures will cause lamps to appear different in color. Clean fixture.
	Wrong Lamp?	Check data on lamps which appear different in color. Replace with correct color lamp.
ARC tube discolored or swollen.	Over Voltage from Power Supply?	Check voltage at ballast. Check for current or voltage surges. Check for shorted capacitors and replace if defective.
	Improper Ballast?	Lamp operated on ballast designed for higher wattage lamp. Check ballast nameplate against lamp data.
Short lamp life.	Lamp Damaged?	Check for outer bulb cracks. If air enters outer bulb, arc tube may continue to burn for 100 hours before failure. Check for bulb cracks where glass meets the base due to tightening lamp too firmly in socket or scoring of glass where socket inadvertently touches the lamp bulb. Look for broken arc tube or loose metal parts. Replace lamp. (Bulb leads will cause oxidation of metal parts.)
	Improper Ballast?	Ballast nameplate data should agree with lamp line voltage and lamp use. If improper ballast is used, the lamp life will be shortened. A mismatch may also cause the ballast to fail.

LT-12 SERIES LIGHT TOWER — TROUBLESHOOTING (LAMPS)

TROUBLESHOOTING GUIDE

Use the following procedure and wiring diagram on the opposite page to determine which of the four floodlights is not functioning:

Connections:

1. Make sure that floodlight #1 power cable is plugged into the J1 connector on the T-Bar assembly.
2. Make sure that floodlight #2 power cable is plugged into the J2 connector on the T-Bar assembly.
3. Make sure that floodlight #3 power cable is plugged into the J3 connector on the T-Bar assembly.
4. Make sure that floodlight #4 power cable is plugged into the J4 connector on the T-Bar assembly.
5. With the voltmeter set to the AC position, connect the negative lead of the AC voltmeter to any (neutral) white wire on the junction terminal block. This blocks connects all the neutral wires (white) in the system.
6. Connect the positive lead of the voltmeter to the output side of CB1, and observe that 120 VAC is present. Make sure circuit breaker is **ON**.
7. Repeat step 1-6 for CB2 thru CB4.
8. If the correct output voltages are present for CB1 thru CB4 then it can be assumed that the generator is working correctly and the correct voltage (120 VAC) are being supplied to the ballast.

Starting:

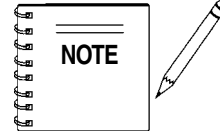
1. Start the generator and verify that there are no abnormal sounds.
2. Turn **CB1** thru **CB4** circuit breakers to the ON position.
3. Wait a few minutes and determine which flood light is not igniting.
4. If one of the floodlights is **OFF**, disconnect its power cable and plug it into a receptacle that is known to be working. **DO NOT** unplug a power cable from the T-Bar while power is being supplied by the generator. Always turn the circuit breaker **OFF** before un-plugging a power cable.
5. If the floodlight still does not ignite after plugging it into a working receptacle (120 VAC present), then it can be assumed that the ballast for that flood light is defective. Replace ballast.

Ballast Removal:

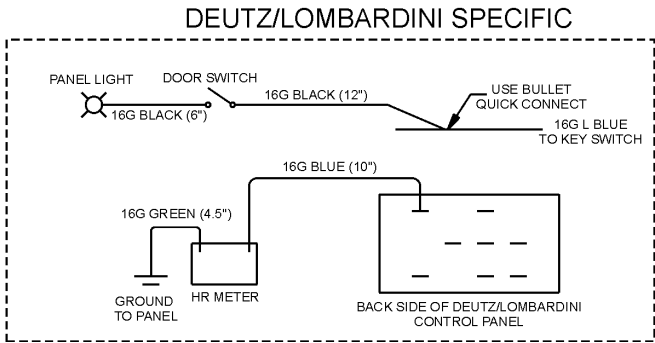
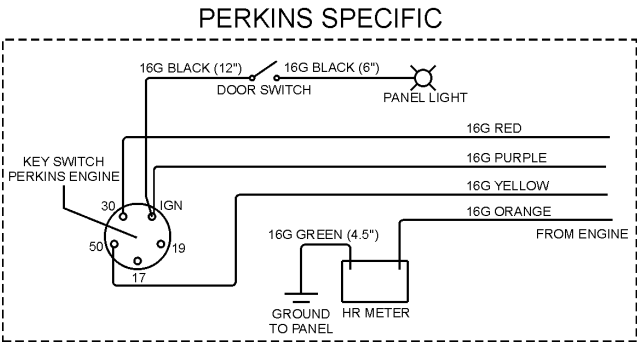
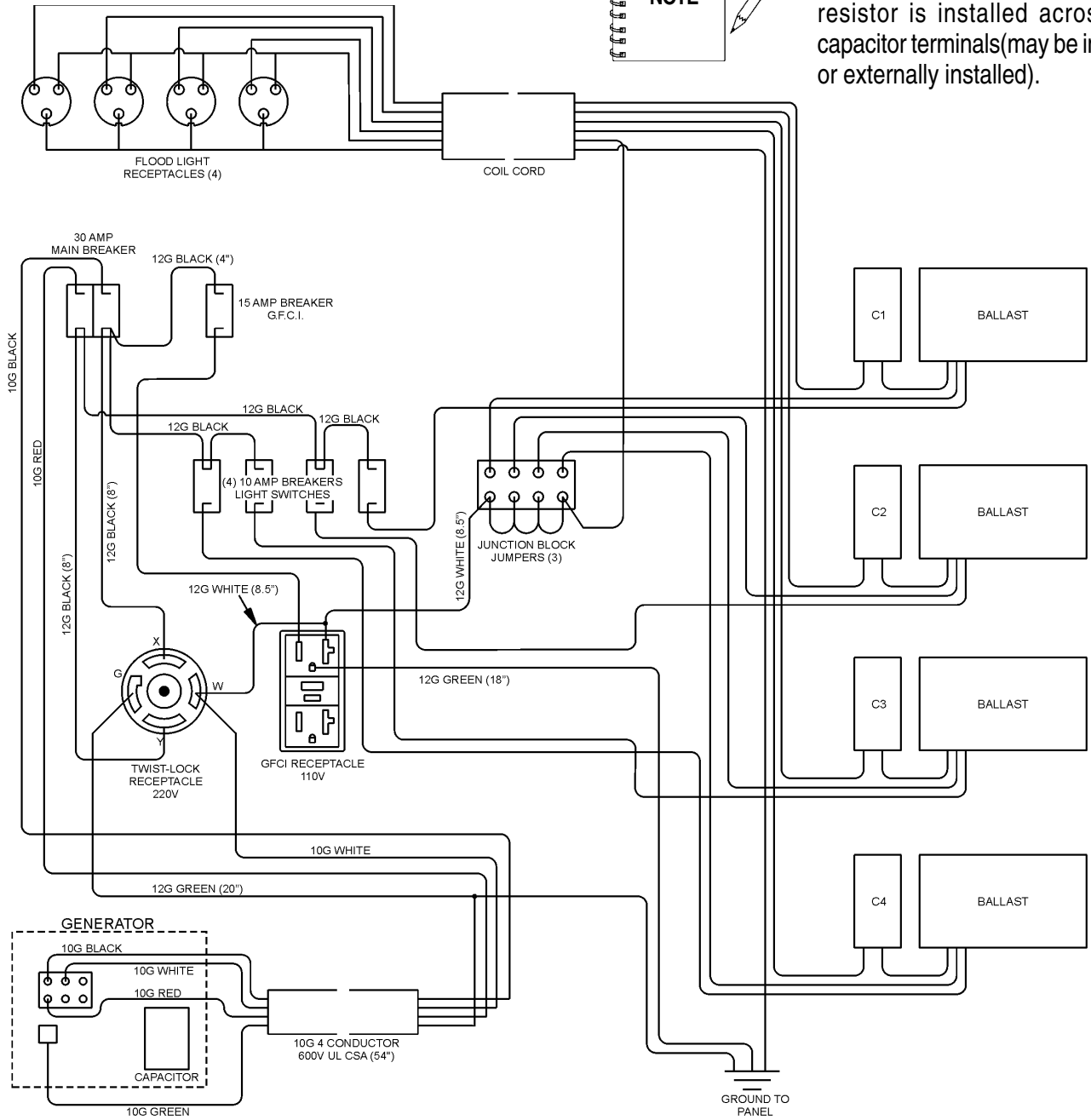
1. Remove the power cable from the generator or welder, and make sure that no voltage is being supplied to the ballast compartment.
2. Remove the four screws securing the ballast cover, and remove cover.
3. Make sure to discharge the ballast capacitor.
3. Remove the defective ballast, taking care to guard against electrical shock when coming in contact with the ballast and capacitor. The capacitor is known to store an electrical charge, that when discharged could result in a harmful shock. Make sure to discharge capacitor.

LT-12 SERIES LIGHT TOWER — SCHEMATIC DIAGRAM

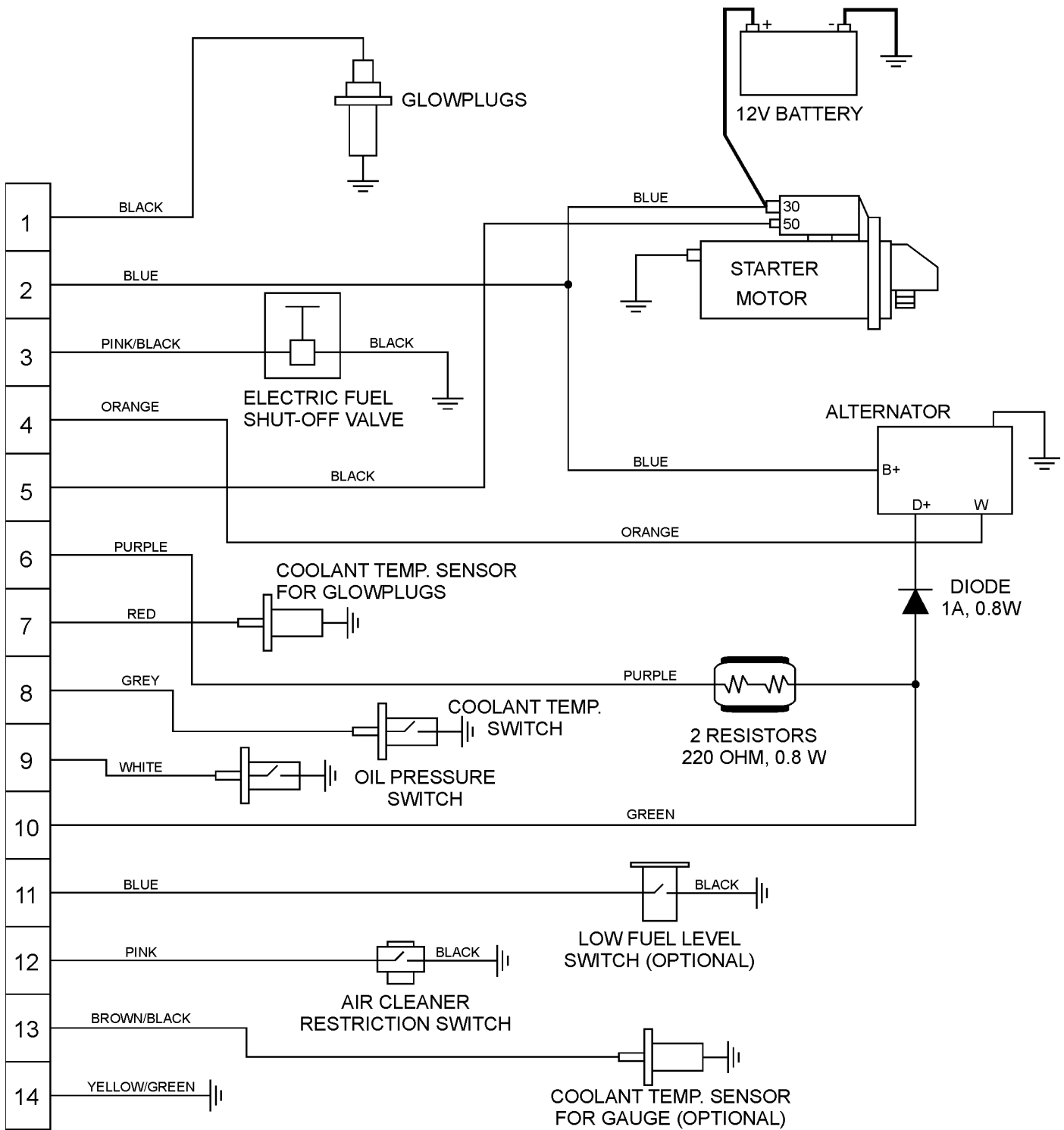
LIGHT TOWER SCHEMATIC DIAGRAM



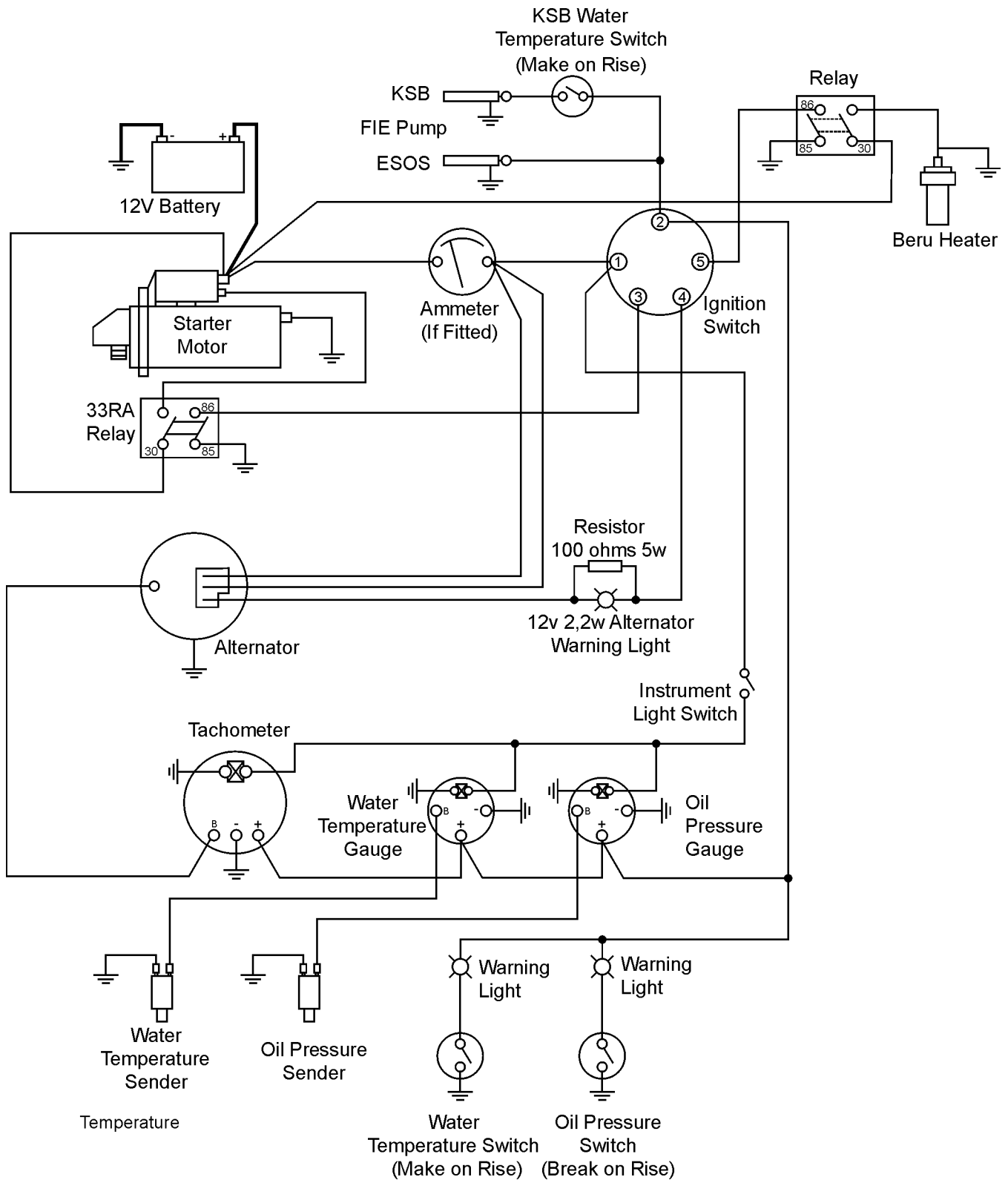
Capacitors C1 thru C4 are 480 VAC, 24 μ f. In addition a 47K Ω (1/2 watt) resistor is installed across the capacitor terminals (may be internal or externally installed).



LT-12 SERIES LIGHT TOWER — DEUTZ ENGINE WIRING



LT-12 SERIES LIGHT TOWER — PERKINS ENGINE WIRING



EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

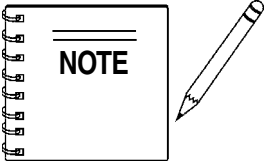
Sample Parts List:

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT	1	INCLUDES ITEMS W/*
2*	12346	WASHER, 1/4 IN.		NOT SOLD SEPARATELY
2*	12347	WASHER, 3/8 IN.	1	MQ-45T ONLY
3	12348	HOSE	A/R ..	MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND UP

NO. Column

Unique Symbols - All items with same unique symbol (*, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the "Remarks" column.

Duplicate Item Numbers - Duplicate numbers indicate multiple part numbers are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.



When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used - Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the "Remarks" Column.

QTY. Column

Numbers Used - Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the "Remarks" Column.

REMARKS Column

Some of the most common notes found in the "Remarks" Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit - All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:
"INCLUDES ITEMS W/(unique symbol)"

Serial Number Break - Used to list an effective serial number range where a particular part is used.

Indicated by:
"S/N XXXXX AND BELOW"
"S/N XXXX AND ABOVE"
"S/N XXXX TO S/N XXX"

Specific Model Number Use - Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:
"XXXXX ONLY"
"NOT USED ON XXXX"

"Make/Obtain Locally" - Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

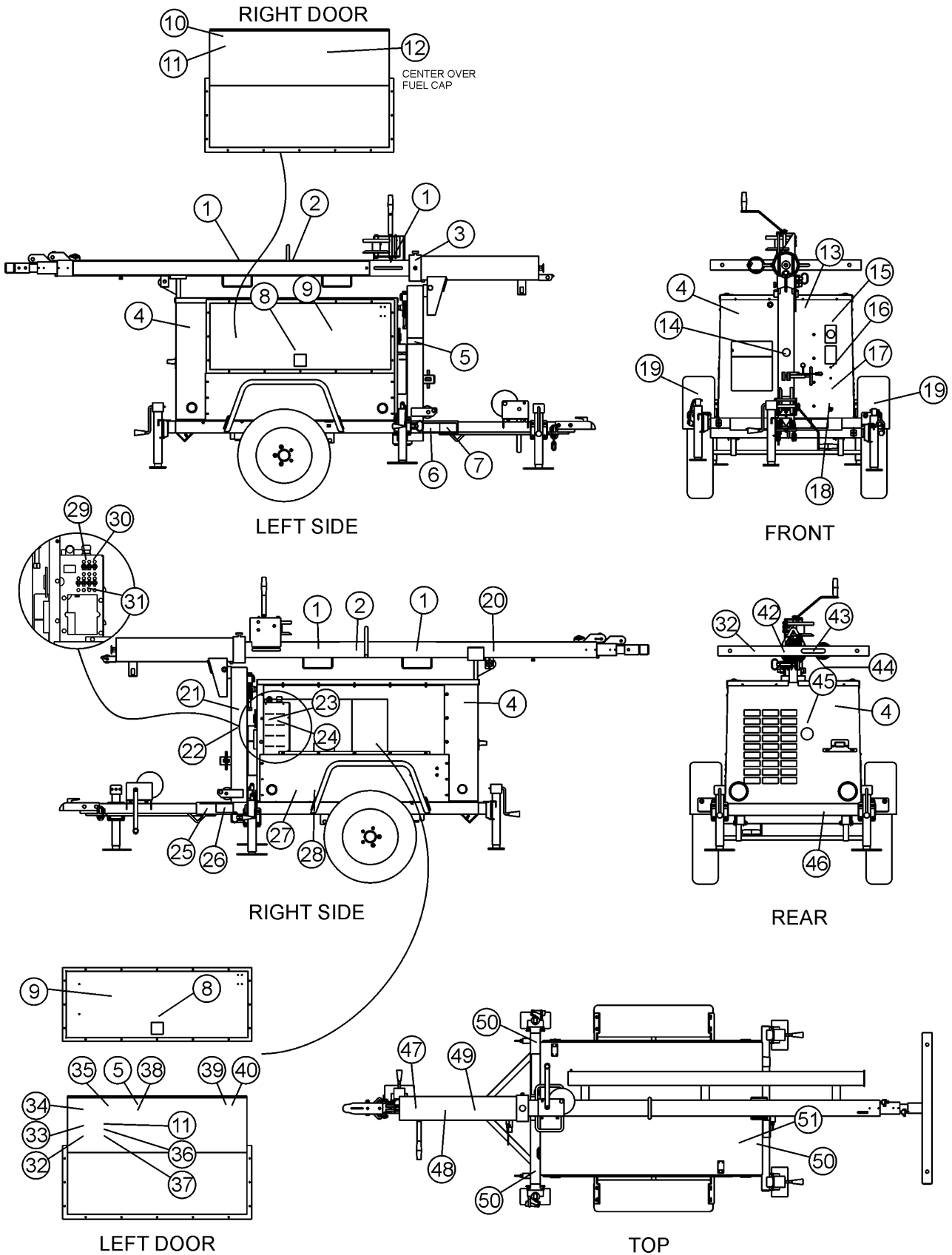
"Not Sold Separately" - Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

LT-12 SERIES LIGHT TOWER — SPARE PARTS**LT-12 SERIES LIGHTTOWER
1 TO 3 UNITS**

<u>Qty.</u>	<u>P/N</u>	<u>Description</u>
2	64167441	CLAMP, LIGHT
2	64167100	GASKET, LENS
2	64167744	LENS (GLASS)
2	19823	SUPPORT, TOP LAMP 1000W
2	M1000U	BULB
2	4105012	REFLECTOR
1	19229	BALLAST/TRANSFORMER
1	29169	CORD SET
1	29206	WINCH HANDLE 1500 LB

LT-12 SERIES LIGHT TOWER — NAME PLATE AND DECALS

NAME PLATE AND DECALS



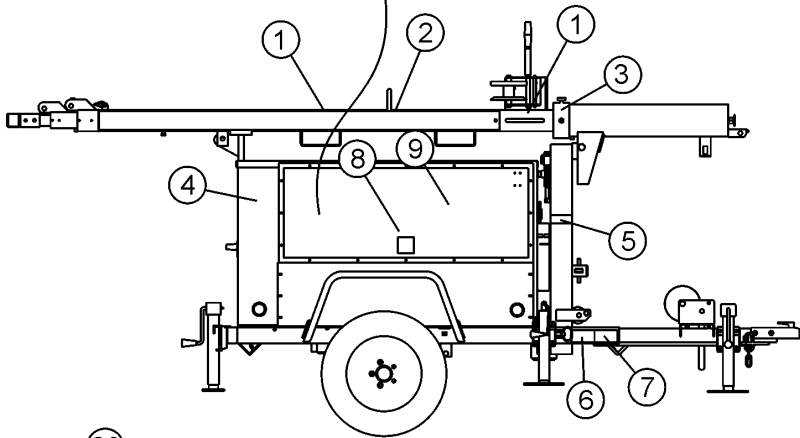
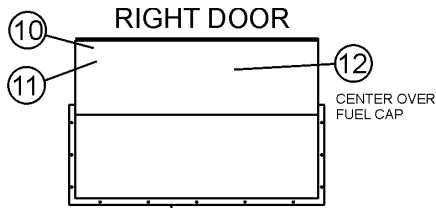
LT-12 SERIES LIGHT TOWER — NAME PLATE AND DECALS

NAME PLATE AND DECALS

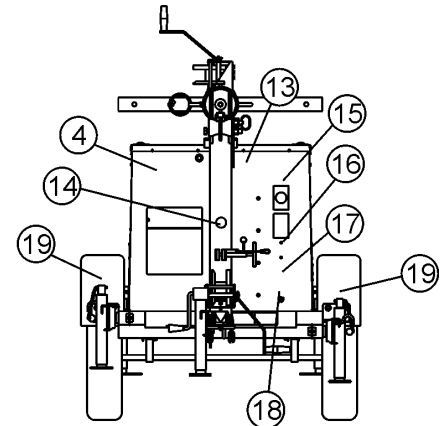
<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29126	DECAL, INSERT FORKS	4	
2	29119	DECAL, LIFT	2	
3	29131	DECAL, LOOSEN	1	
4*	29547	DECAL, SET NIGHTHAWK/MQ LOGO	4	PLACE MQ LOGO HERE. NOT SOLD SEPERATELY
5	35137	DECAL, READ MANUAL, ASK FOR TRAINING	2	
6	29474	DECAL, LUG NUT WARNING	1	
7	29471	DECAL, COUPLER WARNING	1	
8	DCL188	DECAL, OPERATE WITH DOORS CLOSED	2	
9*	29547	DECAL, SET NIGHTHAWK/MQ LOGO	2	PLACE NIGHTHAWK LOGO HERE. NOT SOLD SEPERATELY
10	DCL191	DECAL, WARNING BATTERY FUMES	1	
11	DCL182	DECAL, MOVING PARTS	2	
12	DCL184	DECAL, WARNING DIESEL FUMES	1	
13	DCL181	DECAL, HOT PARTS	1	
14	13118	DECAL, POWDER COAT	1	
15	29722	DECAL, 220V OUTLET	1	
16	DCL186	DECAL, 110V OUTLET	1	
17	29127	DECAL, TOWING INSTRUCTIONS	1	
18	29121	DECAL, GROUNDING	1	
19	29125	DECAL, TIRE INFORMATION	2	
20	29133	DECAL, REMOVE PIN BEFORE LIFTING	1	
21	29124	DECAL, NONVERTICAL	1	
22	29120	DECAL, SECURE SPRING	1	
23	DCL187	DECAL, DANGER DO NOT TOUCH WIRING	1	
24	29116	DECAL, DANGER HIGH VOLTAGE	1	

LT-12 SERIES LIGHT TOWER — NAME PLATE AND DECALS

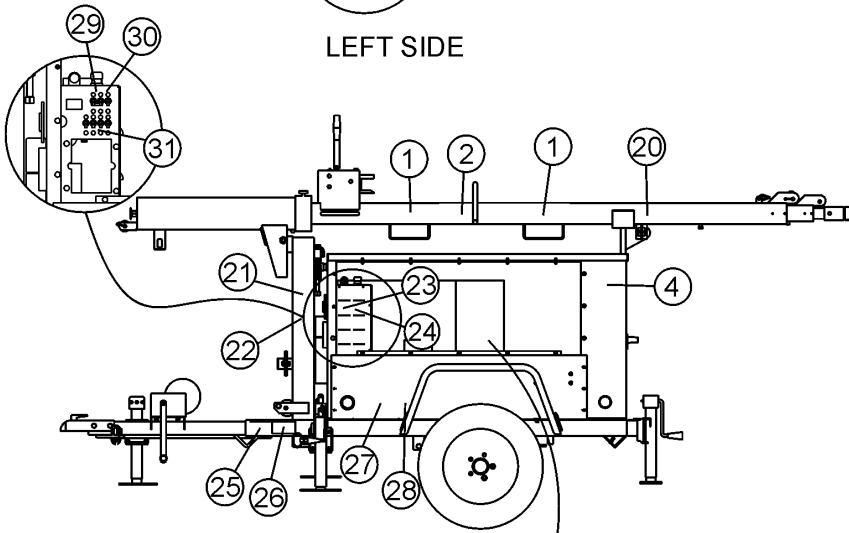
NAME PLATE AND DECALS (CONTINUED)



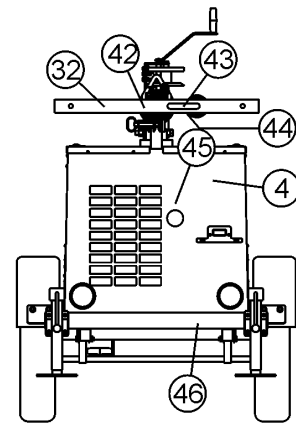
LEFT SIDE



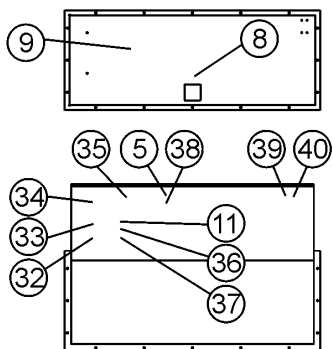
FRONT



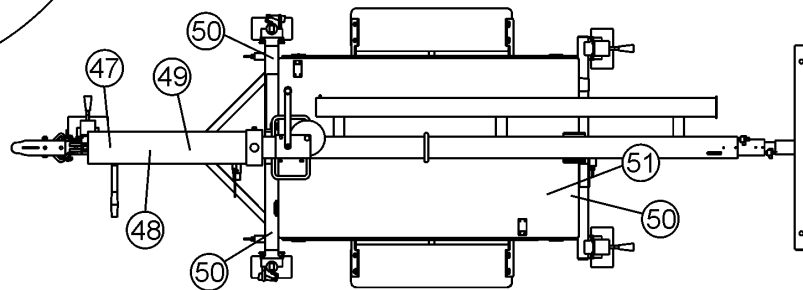
RIGHT SIDE



REAR



LEFT DOOR



TOP

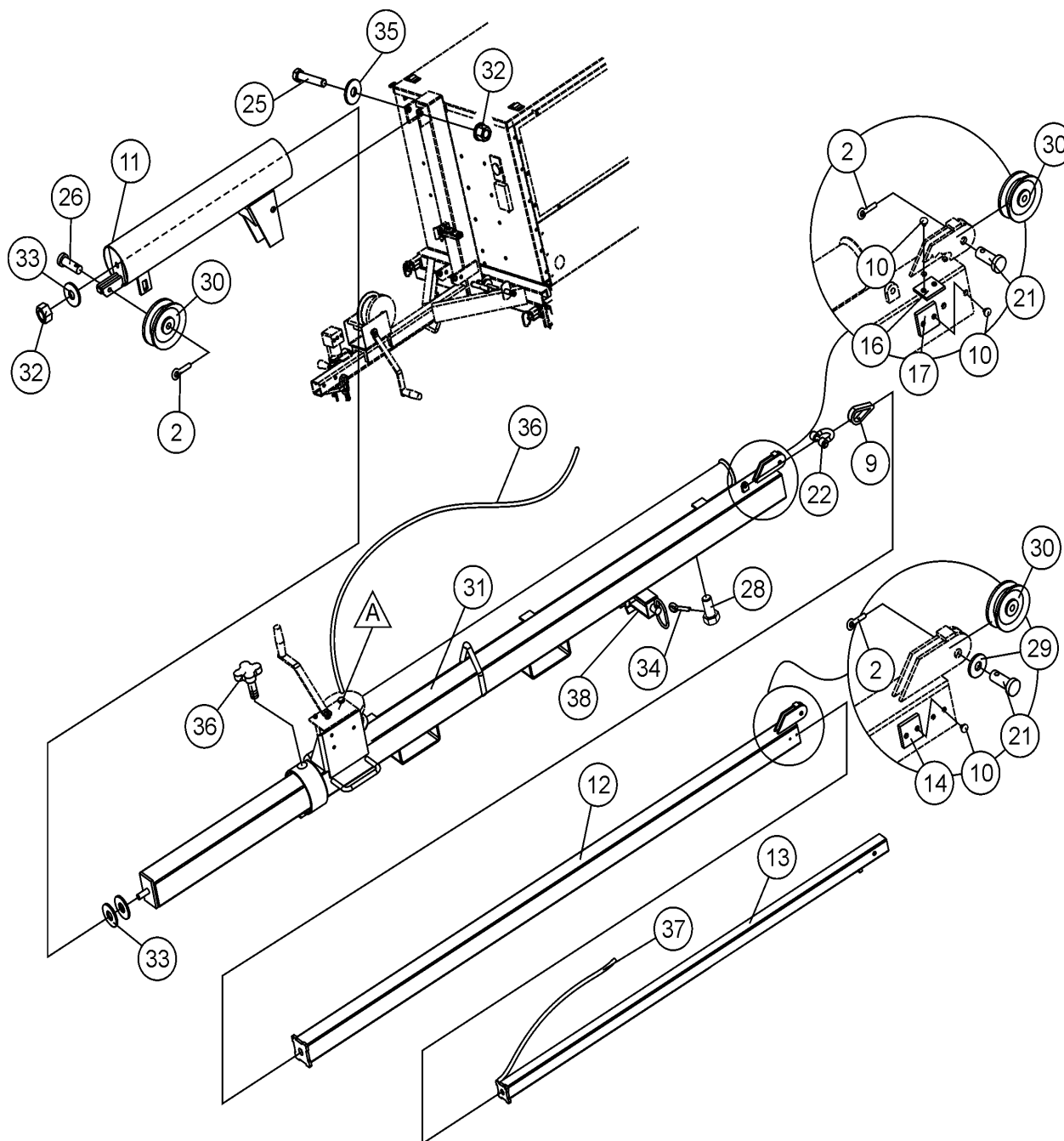
LT-12 SERIES LIGHT TOWER — NAME PLATE AND DECALS

NAME PLATE AND DECALS (CONTINUED)

NO	PART NO	PART NAME	QTY.	REMARKS
25	29473	DECAL, CHAIN WARNING	1	
26	29472	DECAL, ELECTRICAL WARNING	1	
27		DECAL, MULTIPLE TRAILER DATA PLATE	1	CONTACT MQ PARTS DEPT.
28	29730	DECAL, US FLAG	1	
29	DCL189	DECAL, 230A BREAKER	1	
30	DCL199	DECAL, 120A BREAKER	1	
31	29130	DECAL, LIGHT CONTROL	1	
32	29132	DECAL, WARNING SHUT DOWN GEN.	2	
33	29128	DECAL, FAILURE	1	
34	29118	DECAL, ELECTRICAL	1	
35	29134	DECAL, OPERATING	1	
36	DCL180	DECAL, DANGEROUS FUMES	1	
37	DCL197	DECAL, OPERATE AT 1800 RPMS	1	
38	20525	DECAL, WARNING PROP 65	1	
39	DCL193	DECAL, CHECK OIL	1	
40	DCL194	DECAL, CHECK COOLANT	1	
42	19972	REFLECTOR, RED	1	
43	29047	DECAL, HIGH VOLTAGE	1	
44	29705	DECAL, LIGHT NUMBERS	2	
45	DCL181	DECAL, HOT PARTS	1	PERKINS ENGINES ONLY
46	DCL181	DECAL, HOT PARTS	1	DEUTZ/LOMBARDINI ENGINES ONLY
47	29123	DECAL, STAY CLEAR	1	
48	29651	DECAL, OVERHEAD POWERLINES	1	
49	29135	DECAL, LIGHT TOWER LEVEL	1	
50	DCL106	DECAL, ROTATE JACKS	3	
51	DCL183	DECAL, WARNING HOT COOLANT	1	

LT-12 SERIES LIGHT TOWER — MAST ASSEMBLY

TOWER MAST ASSY.



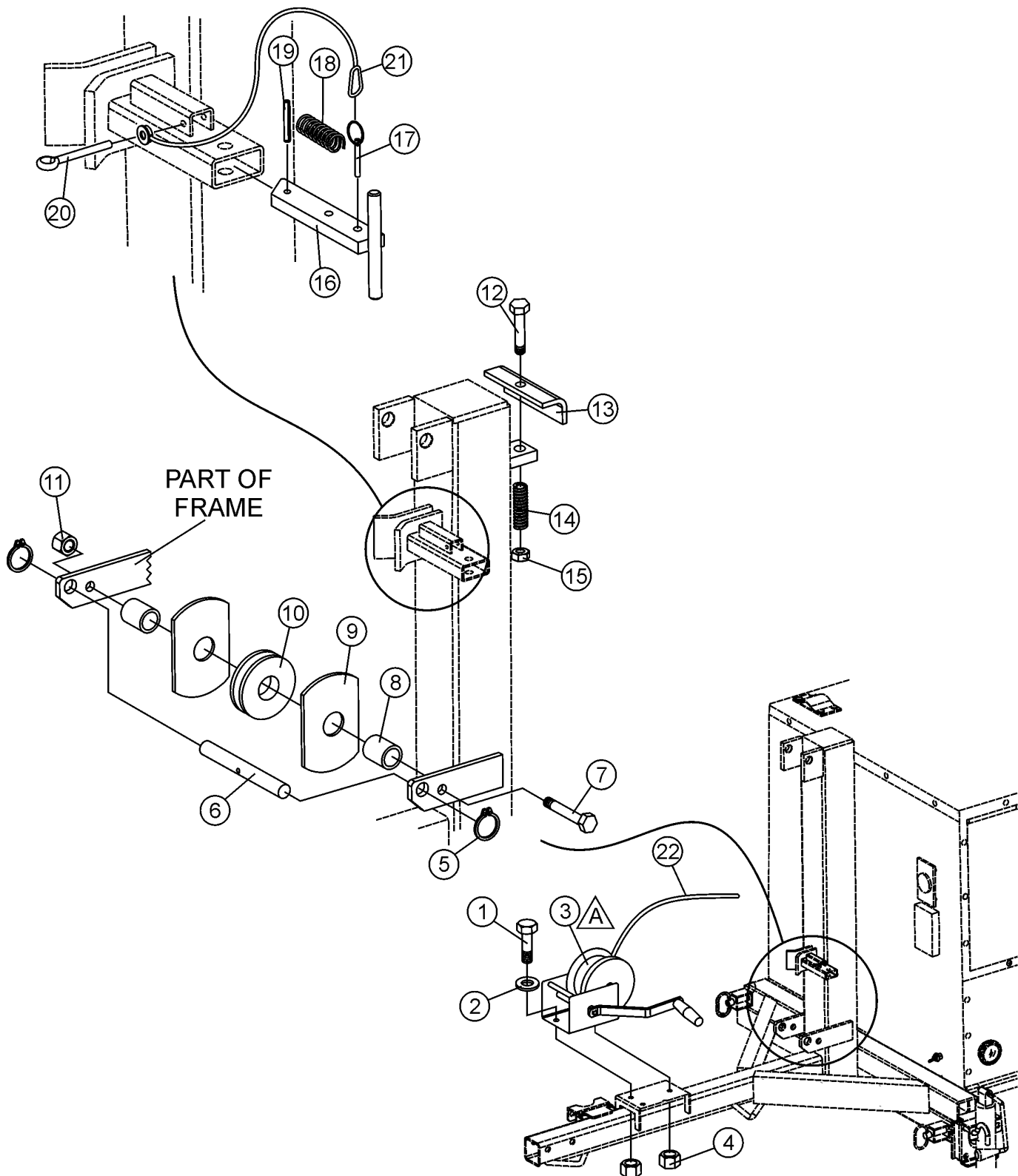
LT-12 SERIES LIGHT TOWER — MAST ASSEMBLY

MAST ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
2	0183	PIN, COTTER 1/8D X 1-1/4	3	
3	0948	WASHER, FLAT SAE 1/4	2	
8	11505	CLAMP, HOSE SUPPORT 1/2 INCH LG	1	
9	19200	THIMBLE, 3/16 WIRE	1	
10	19847	RIVET, POP, ALUM, 3/16x1/8-1/4 GRIP	16	
11	19882	SWIVEL, BASE W/A	1	
12	19920	TUBE, TW-MID W/A	1	
13	19923	TUBE, TWR TOP W/A	1	
14	19926	SPACER, BEARING TWR (0.333 X 2 SQ)	2	
15	19927	SPACER, BEARING TWR (0.375 X 2 SQ)	2	
16	19928	SPACER, BEARING TWR (0.333 X 3 SQ)	2	
17	19929	SPACER, BEARING TWR (0.375X 3 SQ)	2	
18	19938	CABLE, UPPER MAST 140"	1	
19	19939	CABLE, LOWER MAST 231"	1	
20	19973	SWAGE, AL 3/16	2	
21	19974	PIN, CLEVIS 1/2 X 1.25 EFF	2	
22	19975	SHACKLE, ANCHOR CP	1	
23	19976	WINCH, BRK 1500 (FULTON KXI550)	1 REMOVE	
24	19977	KNOB, CLAMP 1/2-13 THREAD	1	
25	19978	SCREW, HHC 3/4-10 x 6.5	1	
26	19988	PIN, CLEVIS 1/2 X 1.75 EFF	1	
27	29011	HANDLE, WINCH MODIFIED, PRODUCTION	1	
28	29075	SCREW, HHC 1/2-13 X 1 DRILLED	1	
29	29114	WASHER, FENDER 1/2 x 2 MLT	1	
30	29155	SHEAVE, 2.00 OD X 0.500 ID	3	
31	29652	TUBE, BOTTOM TOWER W/A	1	
32	5070 B	NUT, NYLOC 3/4-10	2	
33	5079	WASHER, FLAT 3/4 USS	3	
34	6014 B	PIN, COTTER 3/32DX1.00	1	
35	8151	WASHER, FLAT SAE 3/4	2	
36	19977	KNOB, MAST ROTATION CONTROL	1	
36	19939	CABLE, LOWER MAST	1	231 IN. LENGTH
37	19938	CABLE, UPPPER MAST	1	140 IN. LENGTH
38	29664	PIN, SPRING LOCK	1	

LT-12 SERIES LIGHT TOWER — MAST RAISE/LOWER ASSEMBLY

MASTRAISE/LOWER ASSY.



NOTES:

△ SEE WINCH ASSY.

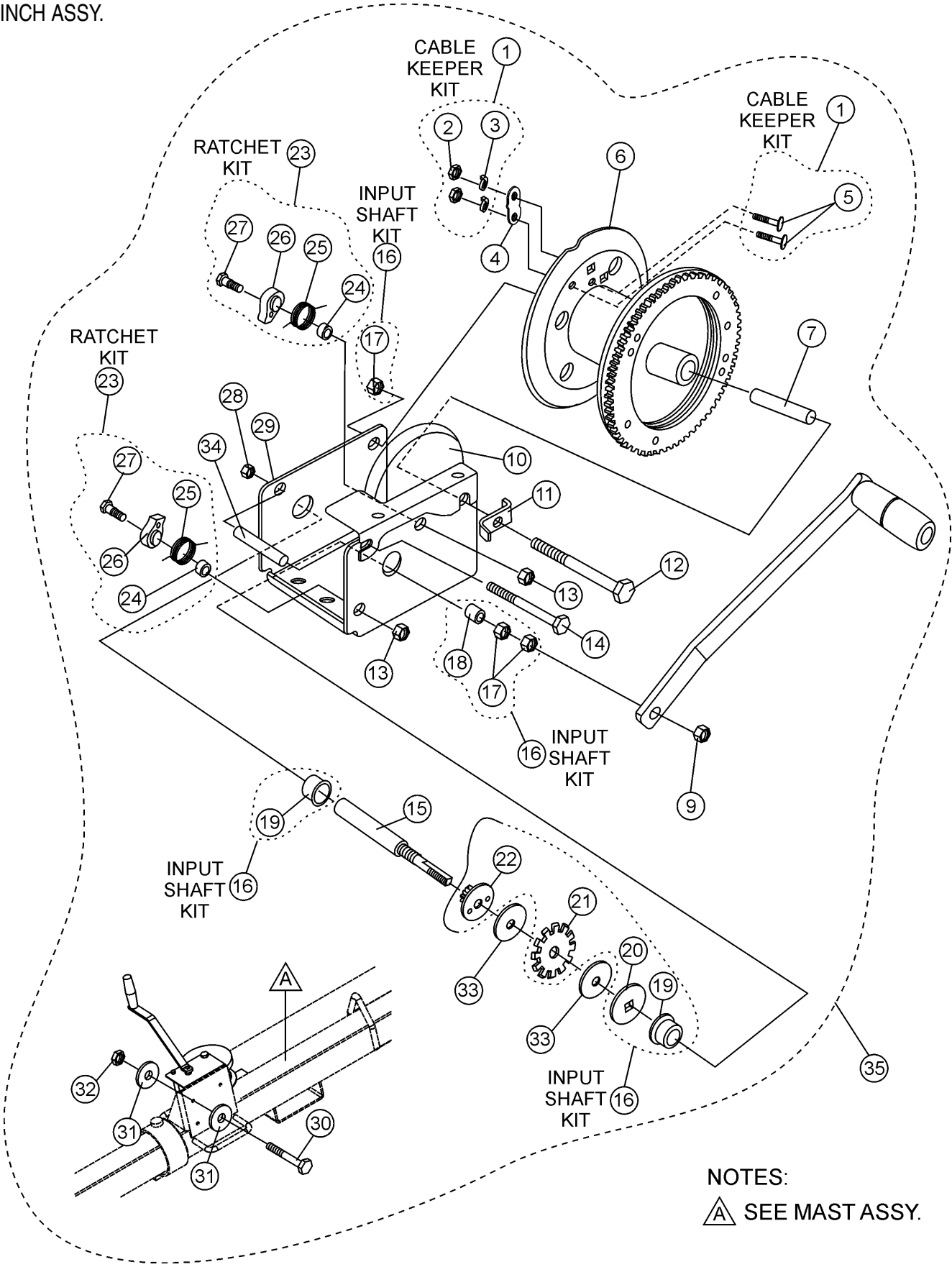
LT-12 SERIES LIGHT TOWER — MAST RAISE/LOWER ASSEMBLY

MASTRAISE/LOWER ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0205	SCREW, HHC 3/8-16 x 1 IN. PLATED	3	
2	10136	WASHER, FLAT 3/8 IN.	3	
3	19976	WINCH, FULTON BRK 1500	1	
4	10133	NUT, NYLOC 3/8-16 IN.	3	
5	1135	SNAP RING	2	
6	29008	PIN, SWAGE BALL SOCKET	1	
7	29017	SCREW, HHC 1/2-13 x 5.5 IN.	1	
8	29018	SPACER, .75 OD x .5 ID x 1.59 IN.	2	
9	29016	GUIDE, WIRE ROPE	2	
10	29155	SHEAVE, 2 OD x .5 IN. ID	1	
11	10176	NUT, NYLOC 1/2-13 IN.	1	
12	29077	SCREW, HHC 5/8-11 x 9.5 IN.	1	
13	29481	STOP, MAST THRUST SPRING	1	
14	19989	SPRING, TOWER	1	
15	9503	NUT, NYLOC 5/8-11 IN.	1	
16	29033	TOWER, LOCK	1	
17	19012	LOCK PIN 5/16 x 2 IN. QUICK RELEASE	1	
18	29482	SPRING, .468 OD x 2.13 IN.	1	
19	20276	PIN, ROLL 1/4 x 1.75 IN.	1	
20	0183	PIN, COTTER 1/8D x 1-1/4 IN.	1	
21	19996	LANYARD	1	

LT-12 SERIES LIGHT TOWER — WINCH ASSY.

WINCH ASSY.

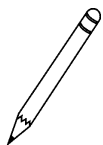
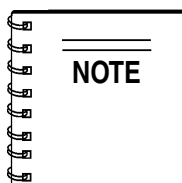


NOTES:
 ▲ SEE MAST ASSY.

LT-12 SERIES LIGHT TOWER — WINCH ASSY.

WINCH ASSY.

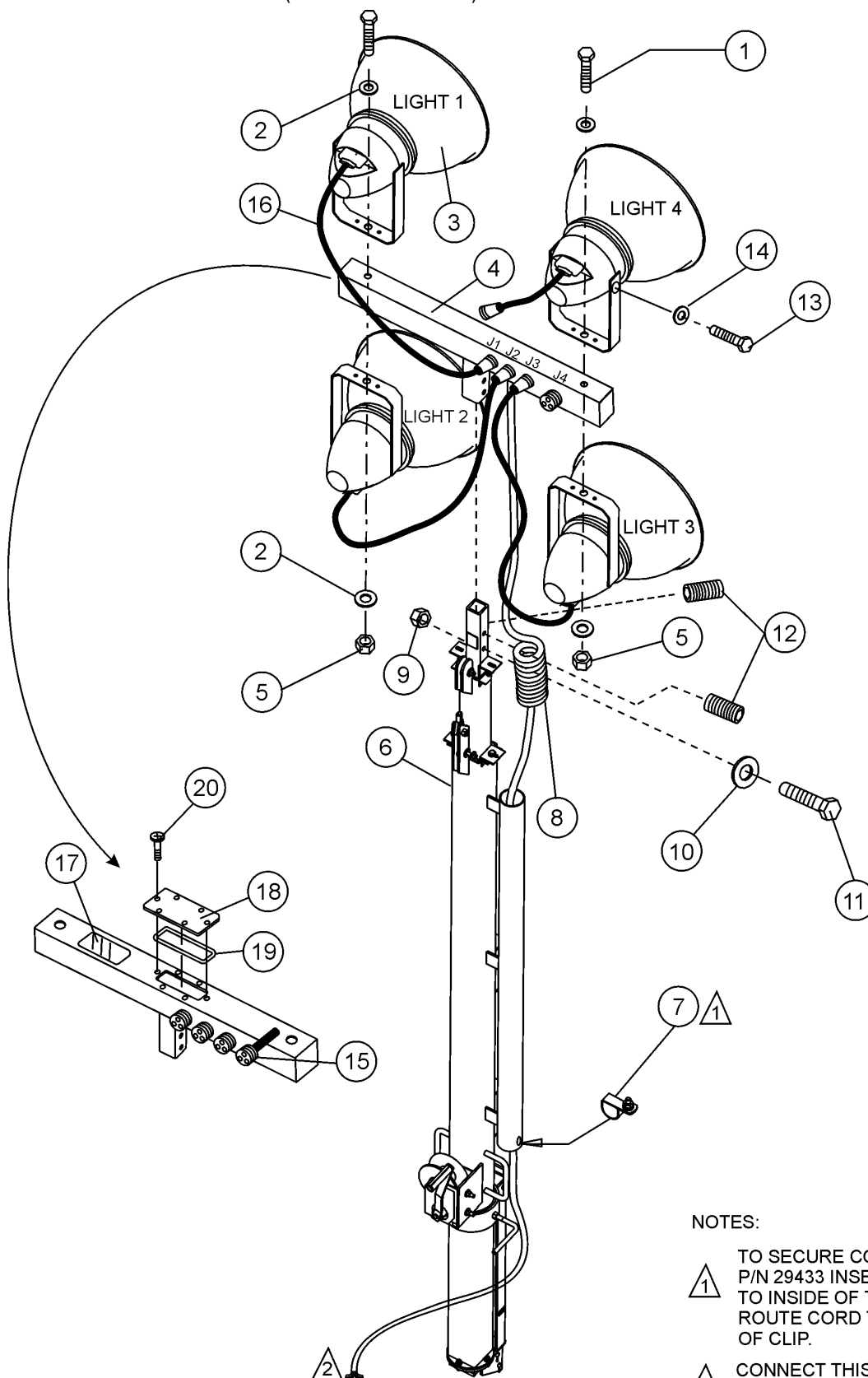
NO	PART NO	PART NAME	QTY.	REMARKS
1+	562101	CABLE KEEPER KIT	2	INCLUDES ITEM W/*
2*+		NUT	2	
3*+		WASHER, LOCK	2	
4*+		CABLE CLAMP	1	
5*+		CARRIAGE BOLT	2	
6+		DRUM ASSY.	1	SEE NOTE 1 BELOW
7+		DRUM SPACER	1	SEE NOTE 1 BELOW
8+	29206	HANDLE ASSY.	1	
9+		LOCK NUT 1/2-13	1	STD. HDW. PURCHASE LOCALLY
10+	12124S01	COVER ASSY	1	
11+		BOLT LOCK	1	SEE NOTE 1 BELOW
12+		CAP SCREW 1/2-13	1	STD. HDW. PURCHASE LOCALLY
13%+		LOCK NUT	2	
14+		CAP SCREW 3/8-16	1	STD. HDW. PURCHASE LOCALLY
15+	1564S01	INPUT SHAFT	1	
16+	1563S01	KIT, INPUT SHAFT	1	INCLUDES ITEM W/#
17#+		LOCK NUT 1/2-13	3	
18#+		SPACER	1	
19#+		BUSHING	2	
20#+		SHAFT BRAKE DISC	1	
21#+		RATCHET GEAR	1	
22#+		PINION AND DISC	1	
23+	6730S00	RATCHET KIT	2	INCLUDES ITEMS W/%
24%+		RATCHET SPACER	2	
25%+		RATCHET SPRING	2	
26%+		RATCHET PAWL	2	
27%+		SHOULDER BOLT 5/16-18	2	
28+		LOCK NUT 3/8-16	1	STD. HDW. PURCHASE LOCALLY
29+		FRAME	1	SEE NOTE 1 BELOW
30+	1284	SCREW, HHC 3/8-16 X 1-1/2	3	
31+	10136	WASHER, FLAT 3/8 SAE	6	
32+	10133	NUT, NYLOC 3/8-16	3	
33+	1558S00	FRICTION DISC KIT	2	
34+		FRAME SPACER	1	SEE NOTE 1 BELOW
35	19976	HAND WINCH 1200 LBS. COMPLETE ASSY.	1	INCLUDES ITEMS W/+



SOLD ONLY AS A COMPLETE
ASSEMBLY. USE PART NUMBER
19976 WHEN ORDERING.

LT-12 SERIES — FLOODLIGHT MOUNTING ASSY. (S/N 901681 AND

FLOODLIGHT MOUNTING ASSY. (UP TO S/N 901681)



NOTES:

⚠️ TO SECURE COIL CORD ASSEMBLY P/N 29433 INSERT CLIP P/N 11505 TO INSIDE OF TUBE AS SHOWN AND ROUTE CORD THROUGH OPENING OF CLIP.

⚠️ CONNECT THIS END OF COIL CORD ASSEMBLY TO BALLAST BOX. SEE SCHEMATIC DIAGRAM.

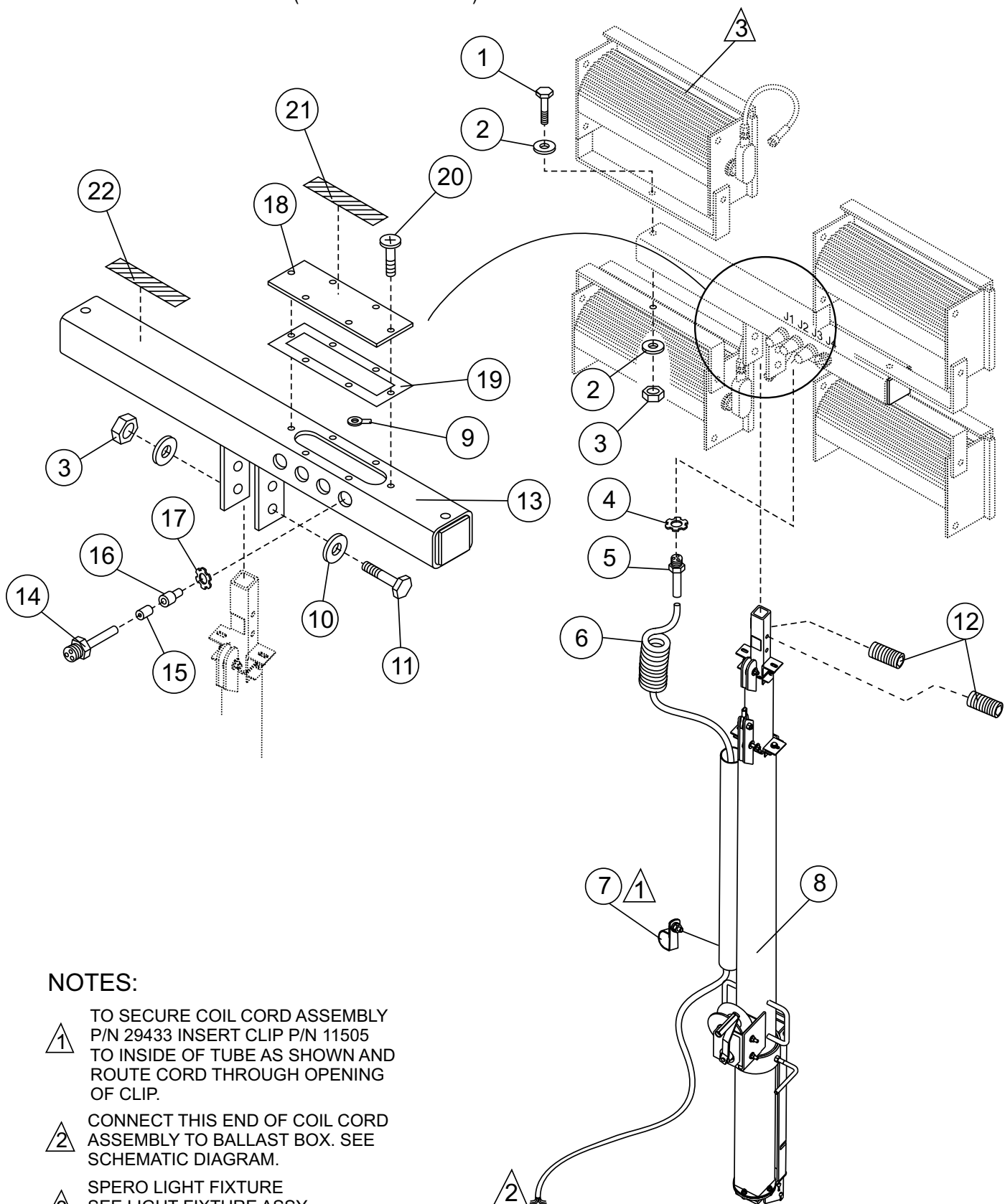
LT-12 SERIES — FLOODLIGHT MOUNTING ASSY. (S/N 901681 AND

FLOODLIGHT MOUNTING ASSY. (UP TO S/N 901681)

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	19249	SCREW, HHC 3/4-16 x 4	2	
2	5079	FLAT WASHER, 3/4	4	
3	29174	FLOOD LIGHT, ASSY.	4	
4	29738	MOUNT, LIGHT FIXTURE W/A	1	
5	19250	NUT, NYLOC 3/4-16 x 4	2	
6	19956	TOWER MASTS, ASSY.	1	
7	11505	CLIP, CABLE	2	
8	29433	KIT, SERVICING MLT POWER CORD ASSY.	1	
9	10176	NUT, NYLOC 1/2-13	1	
10	0447	WASHER, FLAT, 1/2 SAE 2	2	
11	3215	SCREW, HHC 1/2-13 X 3-1/2	1	
12	29190	SCREW, SHS 1/2-20 X 3/8 IN.	2	
13	29161	SCREW, HHC 1/2-13 X 1 SS	2	
14	29162	WASHER, HS 1/2 SS	2	
15	29042	RECEPTACLE, FEMALE (J1,J2,J3 & J4)	4	
16	29169	POWER CORD SET (MALE)	4	
17	19972	REFLECTOR, RED	1	
18	19945	PLATE, COVER	1	
19	19944	GASKET, PLATE COVER	1	
20	29046	SCREW, COVER PLATE	1	
21	19688	INSULATOR, SPLICE CAP PLASTIC	6	
22	19687	COPPER SPLICE CAP	6	

LT-12 SERIES — FLOODLIGHT MOUNTING ASSY. (S/N 901682 AND

FLOODLIGHT MOUNTING ASSY. (S/N 901682 AND UP)



NOTES:

- ① TO SECURE COIL CORD ASSEMBLY P/N 29433 INSERT CLIP P/N 11505 TO INSIDE OF TUBE AS SHOWN AND ROUTE CORD THROUGH OPENING OF CLIP.
- ② CONNECT THIS END OF COIL CORD ASSEMBLY TO BALLAST BOX. SEE SCHEMATIC DIAGRAM.
- ③ SPERO LIGHT FIXTURE SEE LIGHT FIXTURE ASSY (S/N 901682 AND UP), ITEM 16

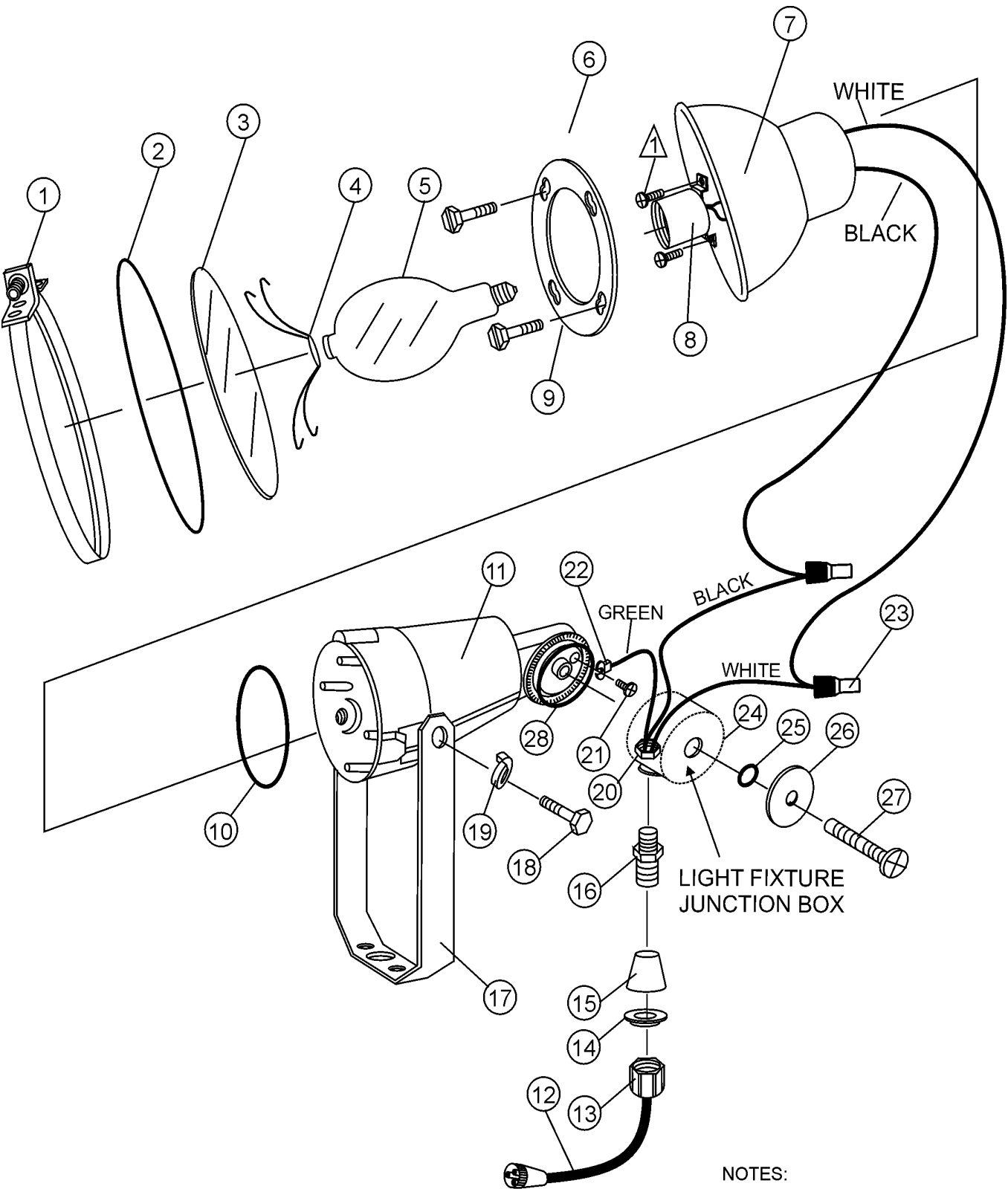
LT-12 SERIES — FLOODLIGHT MOUNTING ASSY. (S/N 901682 AND

FLOODLIGHT MOUNTING ASSY. (S/N 901682 AND UP)

NO	PART NO	PART NAME	QTY.	REMARKS
1	10306	SCREW, HHC 1/2-13 X 4 1/2	2	
2	13211	WASHER, FLAT 1/2 IN. USS	4	
3	10176	NUT, NYLOC 1/2-13	4	
5	19965	CORD GRIP (HUBBELL 07401017)	1	
6	19955	LEAD ASSY TOWER WIRING	1	
9	3254	TERMINAL, RING 16-14 3/8 IN.	1	
10	0447	WASHER, FLAT 1/2 IN. SAE	8	
11	3215	SCREW, HHC 1/2-13 X 3-1/2 IN.	2	
13	29781	TEE-BAR, LIGHT MOUNT, MLT/DLT SPERO	1	
14	29042	RECEPTACLE ASSY	4	
15	19687	CRIMP, SLEEVE (30-410)	6	
16	19688	INSULATOR, SPLICE CAP (2007)	6	
17	26560	NUT, LOCKING 3/4 NPT CONDUIT	1	
18	19945	PLATE, T-BAR WIRING COVER	1	
19	19944	GASKET, T BAR	1	
20	29046	SCREW, PHPM 10-32 X 3/8 IN. ZINC	7	
21	29047	DECAL, HIGH VOLTAGE	1	
22	19972	REFLECTOR, RED, PETERSON #B491R	1	

LT-12 SERIES — LIGHT FIXTURE ASSY. (S/N 901681 AND BELOW)

LIGHT FIXTURE ASSY. (UP TO S/N 901681)



NOTES:
 ▲ INCLUDED WITH SOCKET/W
 LEADS ASSEMBLY (ITEM 8).

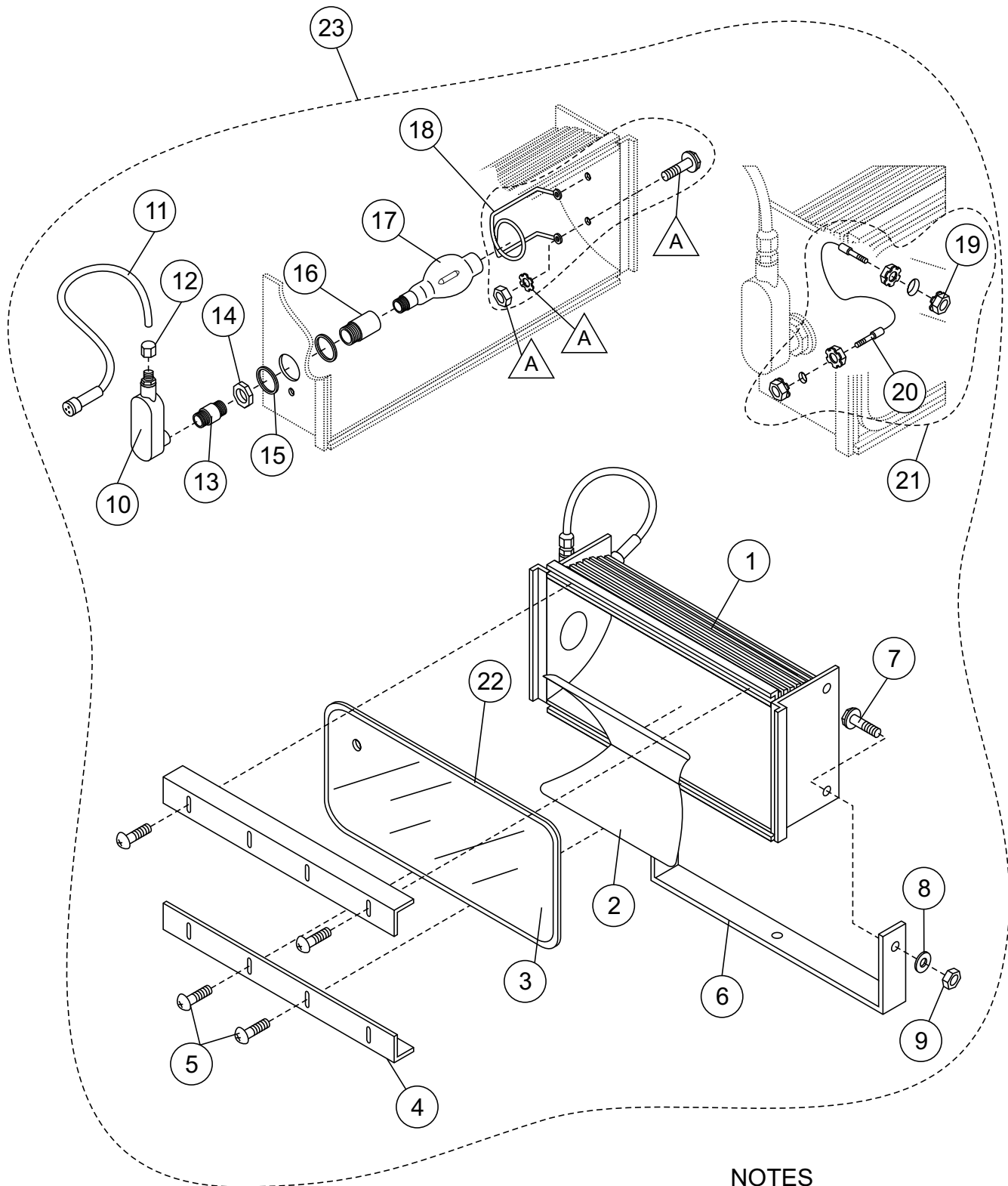
LT-12 SERIES — LIGHT FIXTURE ASSY. (S/N 901681 AND BELOW)

LIGHT FIXTURE ASSY. (UP TO S/N 901681)

NO	PART NO	PART NAME	QTY.	REMARKS
1*	64167441	CLAMP, LIGHT	4	
2*	64167100	LENS GASKET	4	
3*	64167744	LENS (GLASS)	4	
4*	19823	SUPPORT, TOP LAMP 1000 WATT	4	
5*	M1000U	BULB	4	
6*	4101024	REINFORCING RING	1	
7*	4105012	REFLECTOR (WITHOUT GLASS)	4	
8*	4605079000	SOCKET 4KV MONGUL LEADS	4	
9*	70463	SCREW, 10-24 X 5/8 BLACK	16	
10*	2450120	GASKET, HOUSING/REFLECTOR	4	
11*	3100056	FIXTURE HOUSING	4	
12*	29169	CORD SET MOLDED	4	
13*	4110624000	WASHER, 1/2 EXT. TOOTH SS	4	
14*	6900446	SEAL RING .755 ID	4	
15*	6900447	STRAIN RELIEF	4	
17*	4101021	TRUNION (YOKE)	4	
18*	63960	SCREW, HHCS 1/2-13 X 1-1/4	4	
19*	29162	WASHER, LOCK HS 1/2 SS	4	
20*	19695	CONNECTOR, STRAIN RELIEF 5/8-3/4	4	T&B 2535
21*	4107742000	SCREW, 6-32 X 3/8	4	
22*	2856	TERMINAL, SPADE 16-14#8 INSUL.	4	REPLACES 1272
23*	19688	INSULATOR, SPLICE CAP (PLASTIC)	4	
24*	4100003	CONNECTION BOX	4	
25*	2450121	O-RING .206" X 1.03" SILICON	4	
26*	6351110	WASHER, 1/4 X 1-1/4 OD X .63 GALV.	4	
27*	6301045	SCREW, 1/4-20 X 2" PH PH SS	4	
28*	2450119	O-RING, 1.925" ID X 1.03"	4	
29*	4106781000	SCREW, 8-32 X 3/8 PH PH	8	
30*	4104021000	POP RIVET 1/8 X 3/16 DOMED AL	8	
31*	4101023	BRACKET, SOCKET	4	
32	29174	LIGHT FIXTURE ASSY.	1	INCLUDES ITEMS W/*

LT-12 SERIES — LIGHT FIXTURE ASSY. (S/N 901682 AND ABOVE)

LIGHT FIXTURE ASSY. (S/N 901682 AND UP)



NOTES

A INCLUDED W/ITEM 18
NOT SOLD SEPERATELY

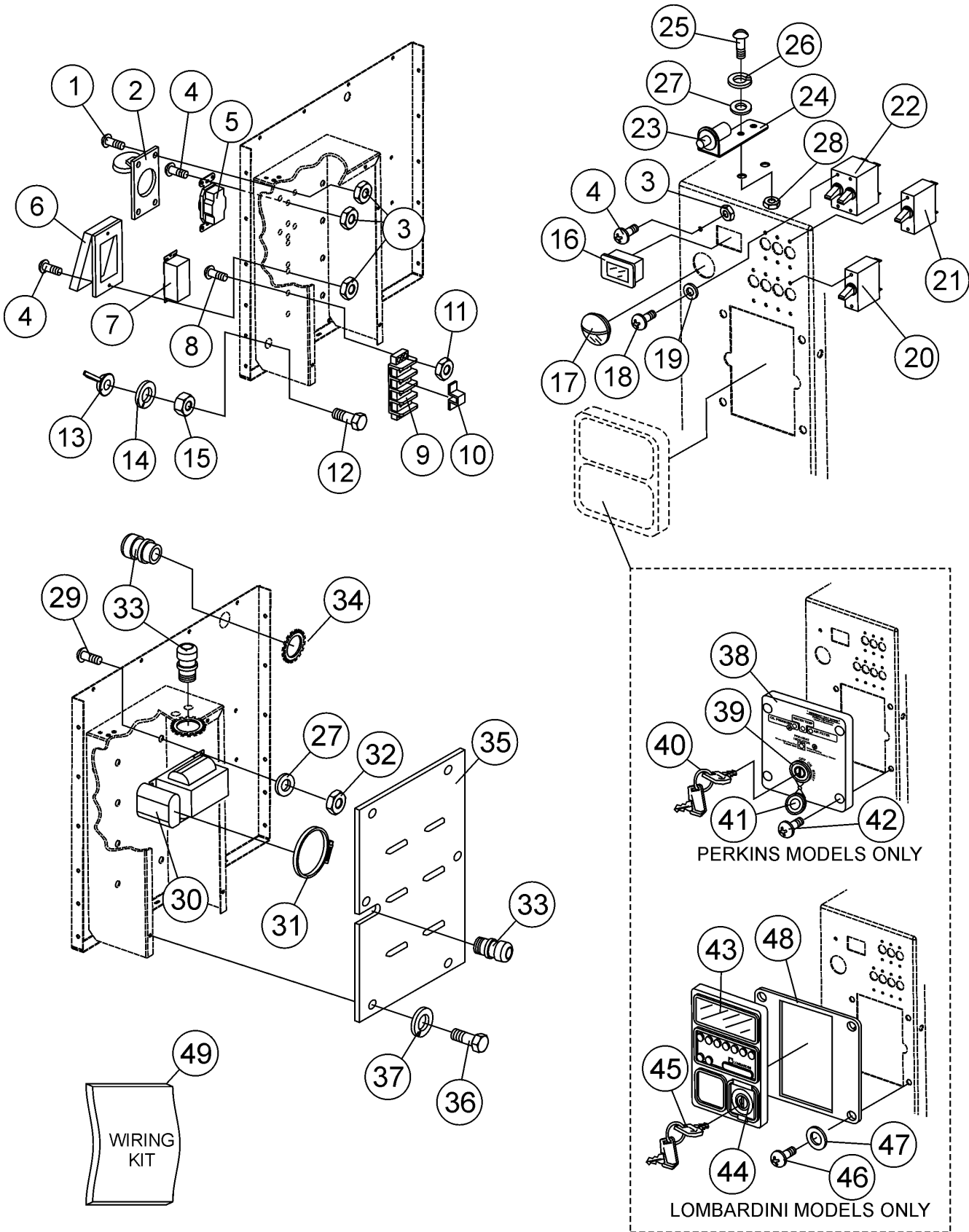
LT-12 SERIES — LIGHT FIXTURE ASSY. (S/N 901682 AND ABOVE)

LIGHT FIXTURE ASSY. (S/N 901682 AND UP)

NO	PART NO	PART NAME	QTY.	REMARKS
1*	20S-REF-1	REF1000 BODY ASSY.	1	
2*	30M-REF-REF	REFLECTOR, ALUMINUM 14-7/8 X 16-5/8 IN.	1	
3*	190Z-Q-REF	REF 1000 LENS	1	
4*	170M-REF-5	REF LENS HOLD DOWN	2	
5*	70Z-FSCR3	SCREW 8-32 X 1/2 IN.	8	
6*	250-REF-6	YOKE, LIGHT FIXTURE	1	
7*	260Z-FSCR9	BOLT, HEX HEAD 1/2-13 x 1-1/2 IN.	2	
8*	280Z-FWFL2	WASHER, FLAT 1/2 IN.	4	
9*	270Z-FNT4	NUT, HEX 1/2-13 IN.	2	
10*	130Z-E76	CONDUIT BODY, 1/2 IN. HUB	1	
11*	150Z-E266	CORD SET, 36 IN. W/3-PIN MALE PLUG	1	
12*	160Z-FSR3	FITTING, CONDUIT BODY 1/2 IN.	1	
13*	100Z-C-93	FLANGE, #5 OR #6	1	
14*	110Z-C-91	NUT, CAST #5 OR #6	1	
15*	90Z-G-102	GASKET, HEX #5 OR #6	1	
16*	70Z-SK65	MOGUL SOCKET W/ANTI-VIBRATION GASKET	1	
17*	MVR1000BT37	BULB, LIGHT FIXTURE	1	
18*	50Z-D-REF-SUP	SUPPORT, REF1000 LAMP TIP	1	
19*	230Z-FNTL6-1	KEEP NUT 8-32	4	
20*	TBD	SUPPORT WIRE W/HOLDER	1	
21*	210S-CBL-6	CABLE ASSEMBLY	1	
22*	200-Z-G-106	GASKET, U-CHANNEL REFLECTOR	1	
23	29773	LIGHT FIXTURE ASSY.	1	INCLUDES ITEMS W/*

LT-12 SERIES LIGHTTOWER — CONTROL PANEL/BALLAST ASSY.

CONTROL PANEL/BALLAST ASSY.



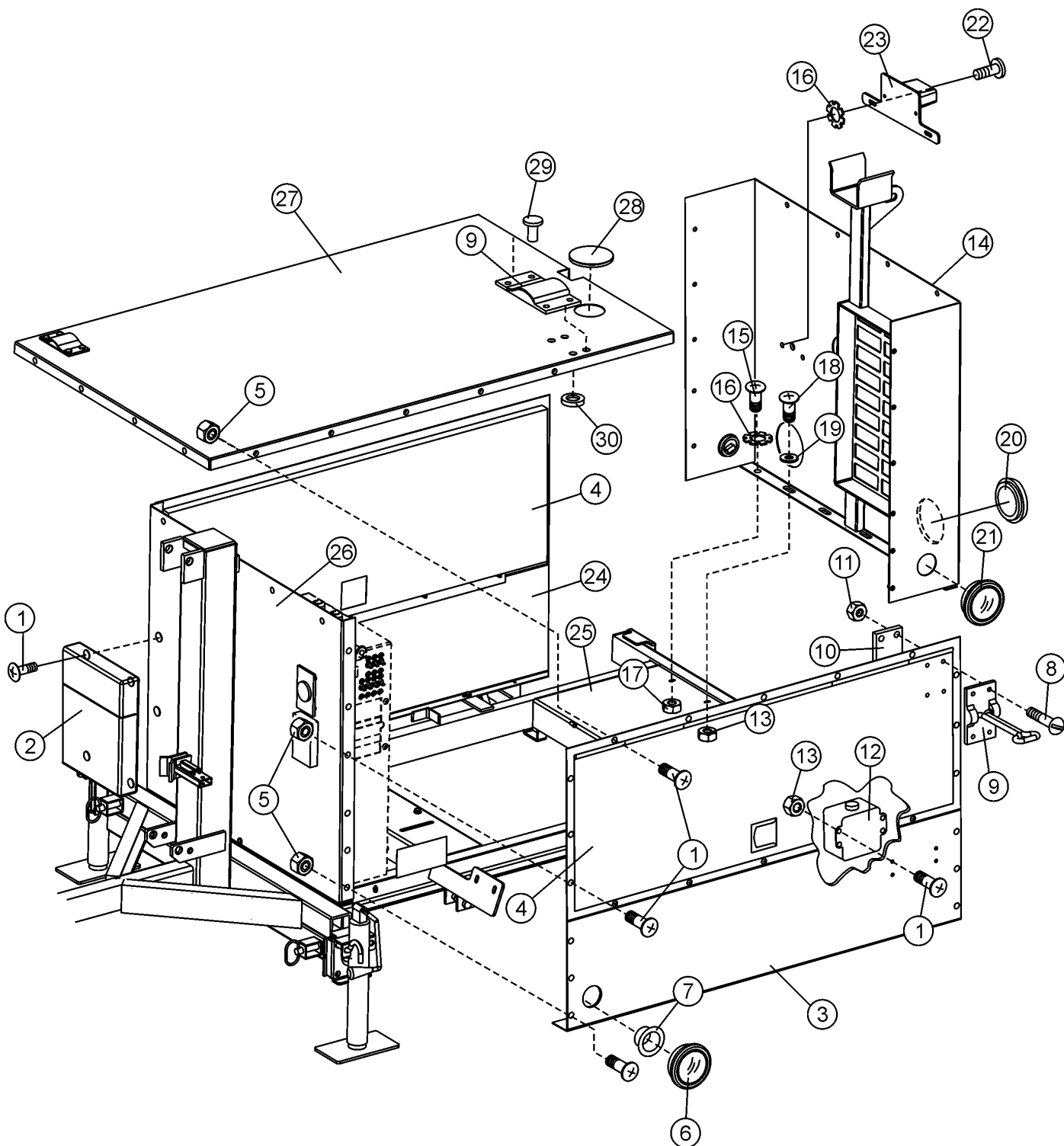
LT-12 SERIES LIGHT TOWER — CONTROL PANEL/BALLAST ASSY.

CONTROL PANEL/BALLAST ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	15177	SCREW, PAN HEAD 10-32 X 1	4	
2	29647	COVER, 220 OUTLET COOPER P/N 1990	1	
3	10019	NUT, NYLOC 10-32	9	
4	5065 B	SCREW, RHM #10-32 x 0.5	5	
5	29276	RECEPTACLE, 4PRG LOCKING 30A, 120/250V	1	
6	29646	COVER, 110 GFI OUTLET COOPER P/N 2966	1	
7	29343	DUPLEX OUTLET, 15A 120V GFCI UL CSA	1	
8	1623	SCREW, RHM #10-24 x 0.75	2	
9	19968	TERMINAL BLOCK (DC 70014)	1	
10	29071	CONNECTOR, QUICK SCREW TERMINAL	3	
11	1618	NUT, NYLOC 10-24	2	
12	0205	SCREW, HHC 3/8-16 X 1 PLATED	1	
13	W29109	NUT, WING 3/8-16	1	
14	0166 A	WASHER, LOCK, 3/8 MED.	1	
15	1876	NUT, HEX FINISH 3/8-16	1	
16	29640	HOUR METER, SENDEC RECT FLUSH MOUNT	1	
17	19297	LIGHT, PETERSON MFG V438	1	
18	19819	SCREW, PHP #6-32 x 0.25	14	
19	1450	WASHER, FLAT #6 SAE	14	
20	29688	CIRCUIT BREAKER, 120VAC 10A DLT LIGHT	4	
21	29376	CIRCUIT BREAKER, 15A, 227 VAC KD-1800	1	
22	19223	30 A 277 V CIRCUIT BREAKER	1	
23	29603	SWITCH, MOMENTARY OFF COLE HERSEE 9075	1	
24	29607	BRACKET, LIGHT SWITCH DLT	1	
25	0131 A	SCREW, HHC 1/4-20 X 3/4 IN.	2	
26	0181 B	WASHER, LOCK 1/4 IN. MED	2	
27	0948	WASHER, FLAT SAE 1/4	10	
28	19266	NUT, BLIND 1/4-20 X 10 GA	32	
29	12287	SCREW, THP 1/4-20 X 3/4 SS	8	
30	19229	BALLAST/CAPACITOR, M47	4	INCLUDES ITEMS W/*
31*	10434	CLAMP, HOSE WORM 1-9/16 TO 2 SIZE 32	4	
32	10024	NUT, NYLOC 1/4-20	8	
33	29655	FITTING, STRAIN RELIEF HEYCO 3234	3	
34	10237	WASHER, EXT. SHKP #10	3	
35	29615	COVER, BALLAST BOX	1	
36	TBD	BOLT	6	
37	TBD	WASHER, LOCK	6	
37	TBD	SCREW	4	
38	100AC	CONTROL PANEL, PERKINS ENGINE	1	
39	38521160	IGNITION SWITCH W/KEY, PERKINS	1	INCLUDES ITEMS W/%
40	385210060	KEY, IGNITION, PERKINS	1	
41	390190030	PLATE, IGNITION SWITCH	1	
42	TBD	SCREW	4	
43	TBD	CONTROL PANEL, DEUTZ/LOMBARDINI ENGINE	1	
44	12850033	IGNITION SWITCH W/KEY, DEUTZ	1	
45	12850033KEY	KEY, IGNITION	1	
46	TBD	SCREW	4	
47	TBD	WASHER, FLAT	4	
48	TBD	MOUNTING PLATE, CONTROL PANEL	1	
49	29675	WIRING KIT, DLT	1	

LT-12 SERIES LIGHT TOWER — CABINET ASSY.

CABINET ASSY.



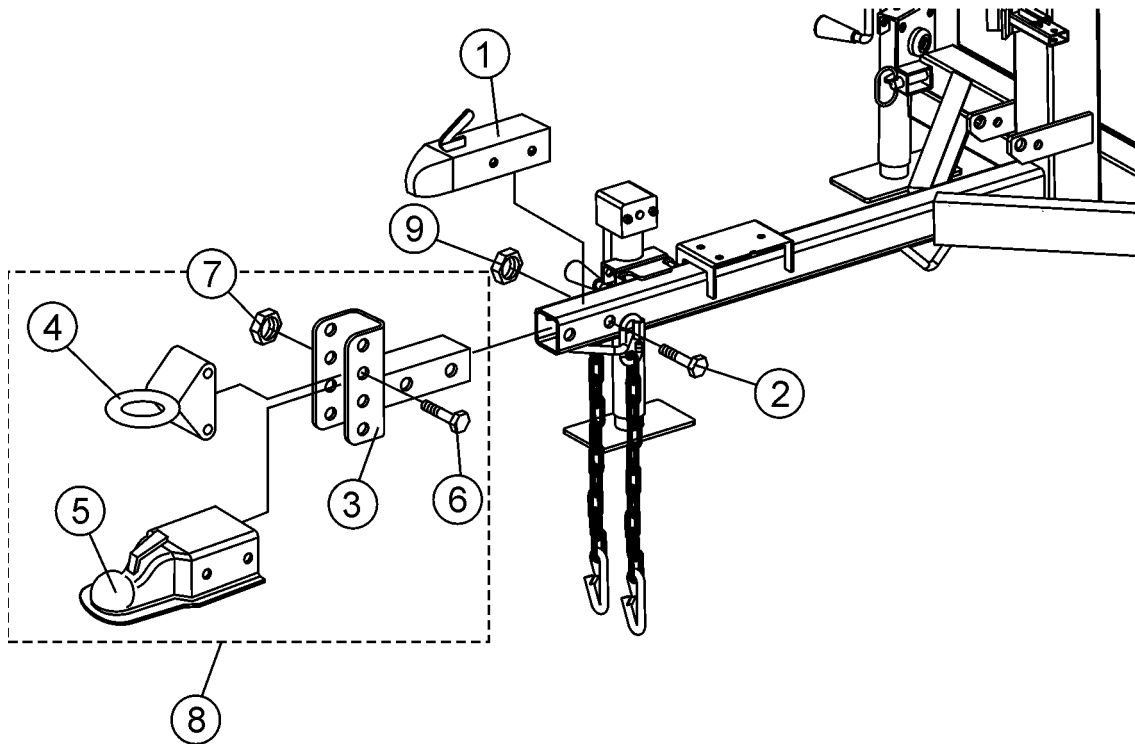
LT-12 SERIES LIGHT TOWER — CABINET ASSY.

CABINET ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	12287	SCREW, THP 1/4-20 X 3/4 SS	64	
2	29057	DOCUMENT BOX, CP90007-07	1	
3	29561	PANEL, LEFT LOWER DLT W/A	1	
4	29658	DOOR ASM, DLT	2	
5	19266	NUT, BLIND 1/4-20 X 10 GA	44	
6	29563	LIGHT, 2" ROUND AMBER M146A	2	
7	29564	GROMMET, 2" ROUND B146-18	4	
8	11942	SCREW, RHM 10-32 X 1-1/4	8	
9	29281	HOLD BACK, DOOR, PURCHASE ASM	2	
10	29689	PLATE, BACKING DLT DOOR HOLD BACK	2	
11	1618	NUT, NYLOC #10-24	8	
12	29653	TANK, COOLANT RECOVERY 1 QT DLT	1	
13	10024	NUT, NYLOC 1/4-20	28	
14	29559	PANEL, REAR W/A DLT	1	
15	5065 B	SCREW, RHM #10-32 x 0.5	4	
16	10237	WASHER, EXT. SHKP, #10	6	
17	10019	NUT, NYLOC #10-32	8	
18	29712	BOLT, CARRIAGE 1/4-20 x 3/4	8	
19	0948	WASHER, FLAT SAE 1/4	22	
20	29610	LIGHT KIT, STOP/TAIL, DLT	2	
21	29611	LIGHT, 2" ROUND RED M146R	2	
22	29341	RIVET, POP 3/16 x 1/4-3/8 IN. GRIP	10	
23	29552	BRACKET, LICENSE PLATE WITH LIGHT	1	
24	29663	PANEL, RIGHT LOWER DLT W/A	1	
25	29532	FRAME, DLT W/A	1	
26	29615	PANEL, FRONT DLT	1	
27	29553	PANEL, TOP DLT W/A	1	
28	29690	COVER, PLASTIC SNAP 3.00 DIA HOLE	1	
29	29341	RIVET, POP, SS, 3/16x1/4-3/8 GRIP	10	
30	29342	WASHER, 3/16" POP-RIVET BACKUP SS	8	

LT-12 SERIES LIGHT TOWER — HITCH ASSY.

HITCH ASSY.



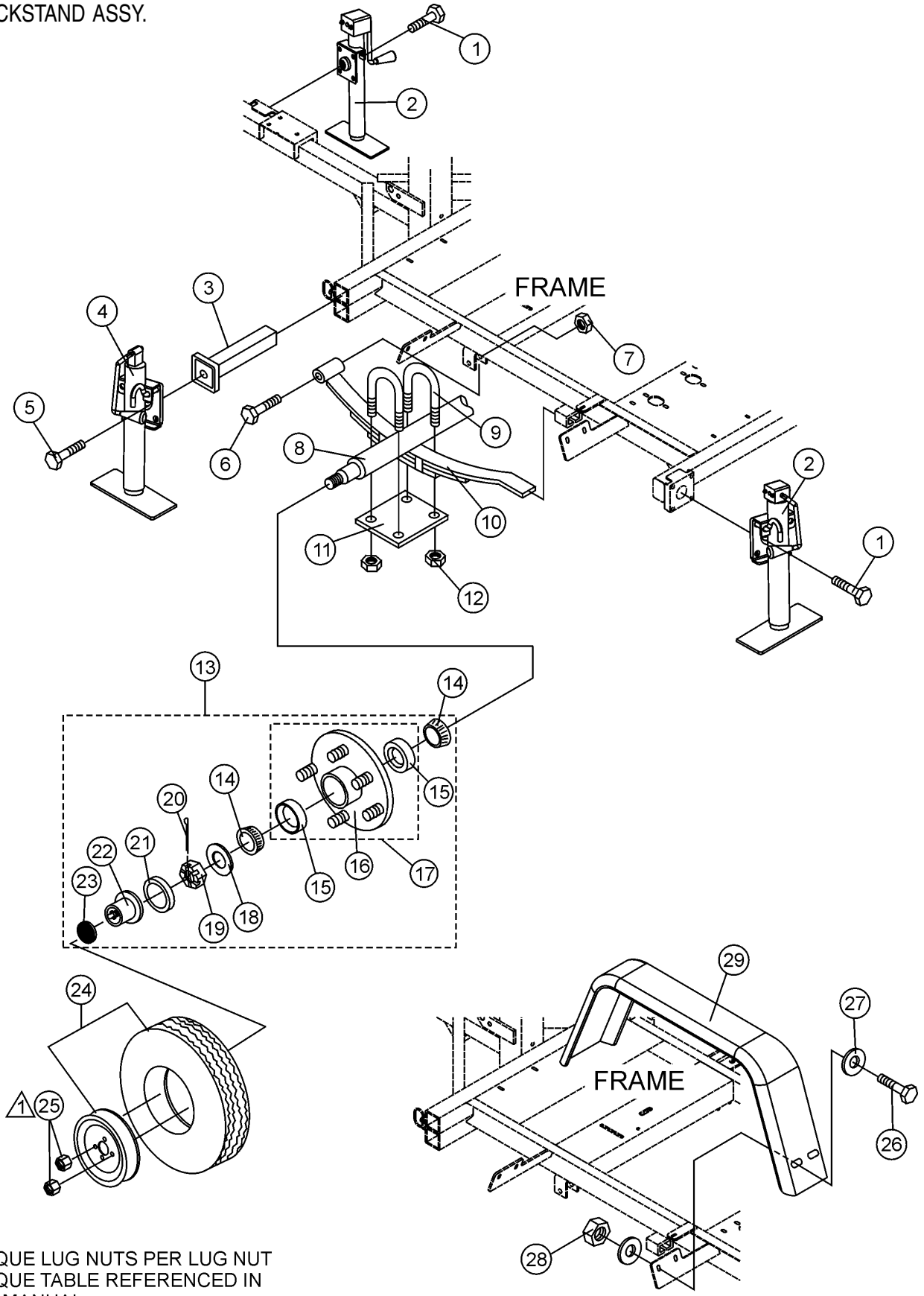
LT-12 SERIES LIGHT TOWER — HITCH ASSY.

HITCH ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29546	COUPLER, 2 IN. BALL	1	2.50 IN. TUBE
2	915217	SCREW, HHC 1/2-13 X 3-1/2 IN. GRD 8	2	
3*	29718	ADAPTER, COUPLING	1	
4*	29369	PINTLE EYE	1	
5*	29228	COUPLER, 2 IN. BALL	1	
6*	9502	BOLT, 5/8-11	2	
7*	9503	NUT, 5/8-11	2	
8	29720	PINTLE KIT	1	INCLUDES ITEMS W/*
9	10176	NUT	2	

LT-12 SERIES LIGHT TOWER — AXLE & JACKSTAND ASSY.

AXLE & JACKSTAND ASSY.



NOTES:
 ⚠ TORQUE LUG NUTS PER LUG NUT
 TORQUE TABLE REFERENCED IN
 THIS MANUAL.

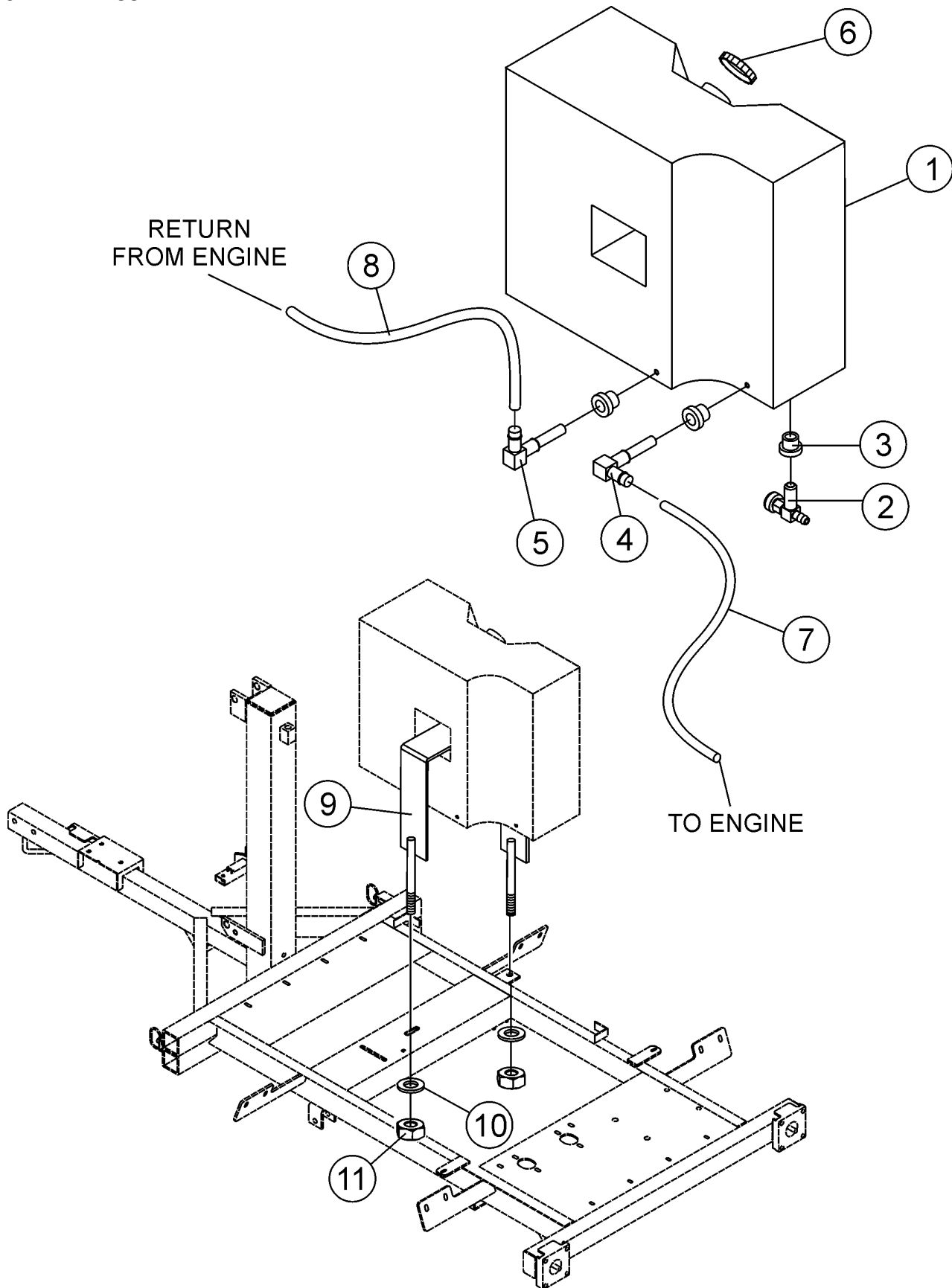
LT-12 SERIES LIGHT TOWER — AXLE & JACKSTAND ASSY.

AXLE & JACKSTAND ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1%		BOLT	3	
2	29479	JACK, SIDEWIND 10" BOLT THRU 0.5" PIN	3	INCLUDES ITEMS W/%
3	29508	OUTRIGGER, W/A WITH BOLT ON MOUNT	2	
4	29478	JACK, TOPWIND 10" BOLT-THRU .5 PIN	2	
5%		BOLT	2	
6	TBD	BOLT, SPRING MOUNTING	2	
7	TBD	NUT	2	
8	9506	AXLE, SPRING,HUB ASM,43 IN.	1	
9	TBD	U-BOLT	4	
10	TBD	LEAF SUPSENSION	2	
11	TBD	PLATE, U-BOLT	2	
12	TBD	NUT	8	
13	9506	AXLE ASSY. (COMPLETE)	1	INCLUDES ITEMS W/#
14#	363180	BEARING CONE (INNER & OUTER)	4	
15*	363913	BEARING CUP (INNER & OUTER)	4	
16*#	363908	STUD, 1/2"-20	10	
17#	363188	HUB ASSY., IDLER	2	INCLUDES ITEMS W/*
18#	363259	WASHER, SPINDLE	2	
19#	363257	SPINDLE NUT 1"-1/4	2	
20#	363258	COTTER PIN	2	
21#	363275	SEAL, GREASE	2	
22#	363277	GREASE CAP (AG)	2	
23#	568067	RUBBER PLUG (AG)	2	
24	19045	WHEEL & TIRE ASSY.	2	
25	8115	NUT, LUG 1/2 - 20 60° CONE	10	
26	205	SCREW, HHC 3/8-16 X 1 PLATED	8	
27	4001	WASHER, FLAT USS 3/8 PLD	16	
28	10133	NUT, NYLOC 3/8-16	8	
29	9505	FENDER, 8X30X13	2	

LT-12 SERIES LIGHT TOWER — FUEL TANK ASSY.

FUEL TANK ASSY.



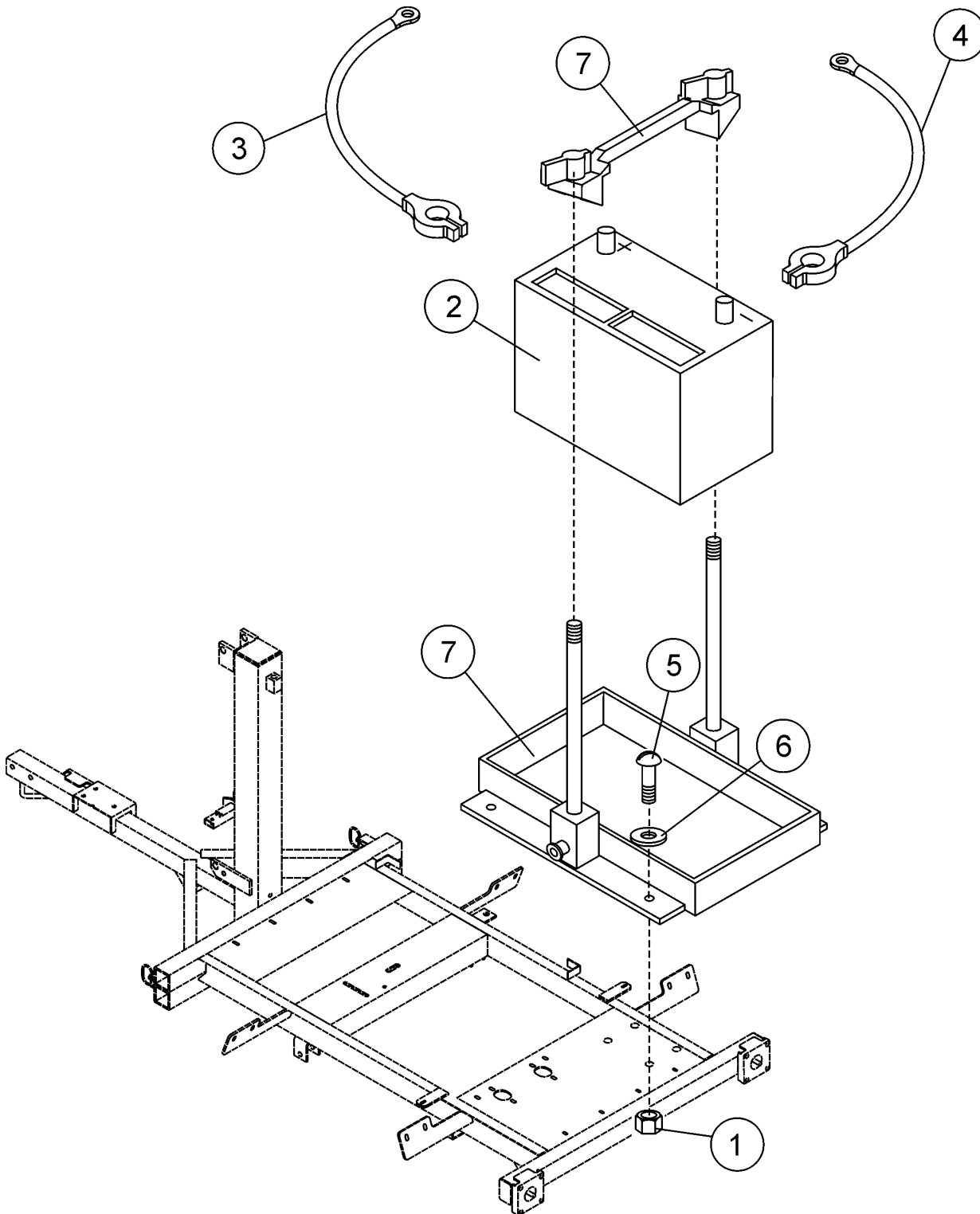
LT-12 SERIES LIGHT TOWER — FUEL TANK ASSY

FUEL TANK ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29605	FUEL TANK	1	
2	19661	VALVE, FUEL DRAIN	1	
3	19633	BUSHING, FUEL	3	
4	12006	FITTING, 90°	1	
5	29677	FITTING, 90°	1	
6	29694	CAP, FUEL TANK W/LANYARD	1	
7	60004	HOSE, FUEL LINE .187 I.D. SAE J30R7 AR	1PC = 1 FT.	
8	60028	HOSE, FUEL RETURN .312 ID SAE J30R7 AR	1PC = 1 FT.	
9	29674	STRAP, FUEL TANK	1	
10	0447	WASHER, FLAT	2	
11	10176	NUT, NYLOCK 1/2-13	2	

LT-12 SERIES LIGHT TOWER — BATTERY ASSY.

BATTERY ASSY.



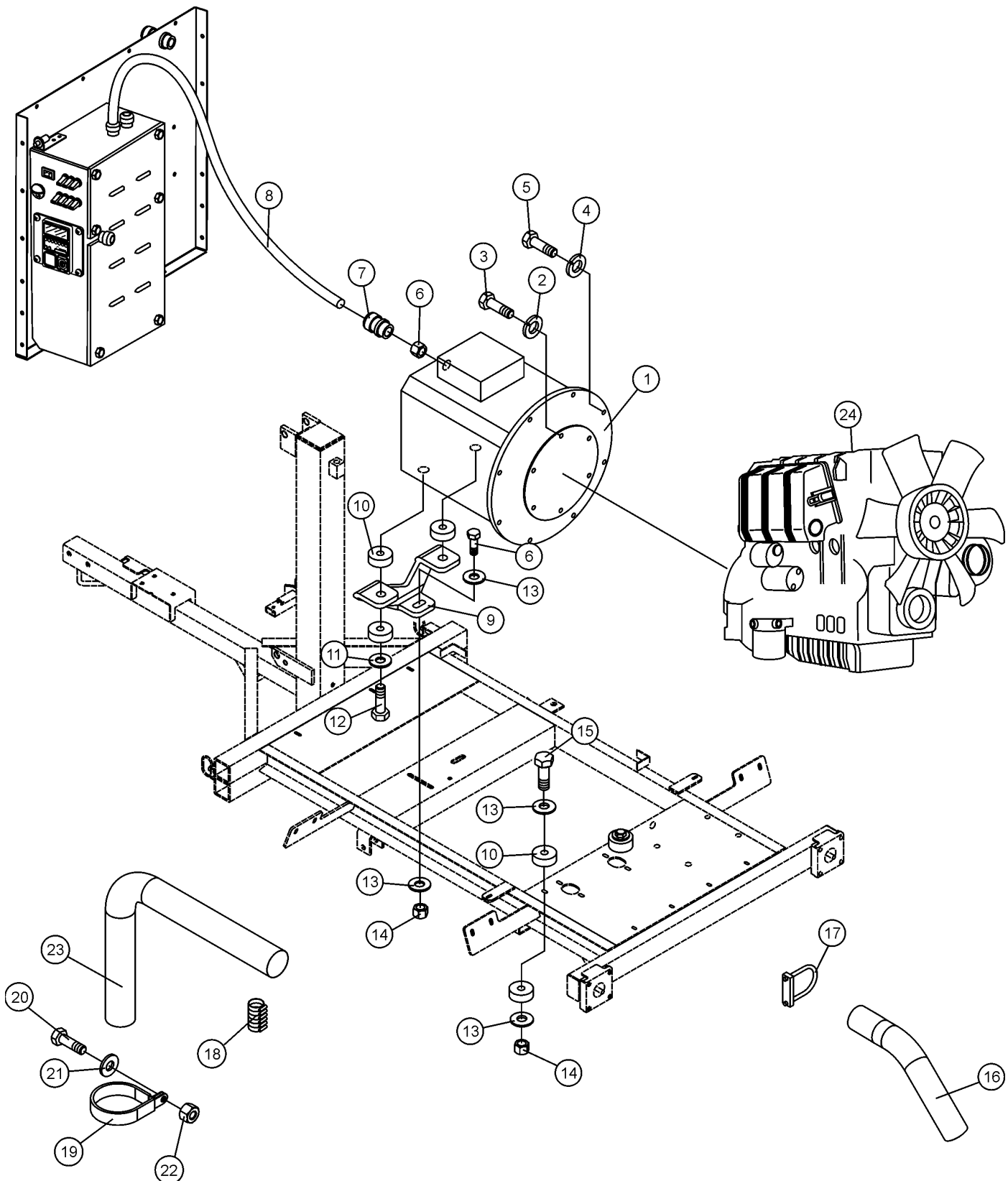
LT-12 SERIES LIGHT TOWER — BATTERY ASSY

BATTERY ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1	1618	NUT, NYLOC 10-32	4	
2	10315	BATTERY, WET 12V GR22	1	
3	29693	CABLE, POS. BATTERY (+)	1	PERKINS ENGINES ONLY
3	10313	CABLE, POS. BATTERY (+)	1	DEUTZ/LOMBARDINI ENGINES ONLY
4	12278	CABLE, NEG. BATTERY (-)	1	
5	1623	SCREW, RHM #10-24 x .75 IN.	4	
6	2203	WASHER, FLAT #10	4	
7	29661	BATTERY TRAY	1	

LT-12 SERIES LIGHT TOWER — GENERATOR & ENGINE MOUNTS (PERKINS)

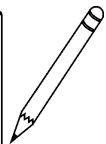
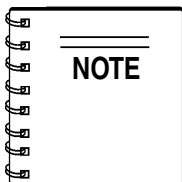
GENERATOR & ENGINE MOUNTS (PERKINS)



LT-12 SERIES LIGHT TOWER — GENERATOR & ENGINE MOUNTS (PERKINS)

GENERATOR & ENGINE MOUNTS (PERKINS)

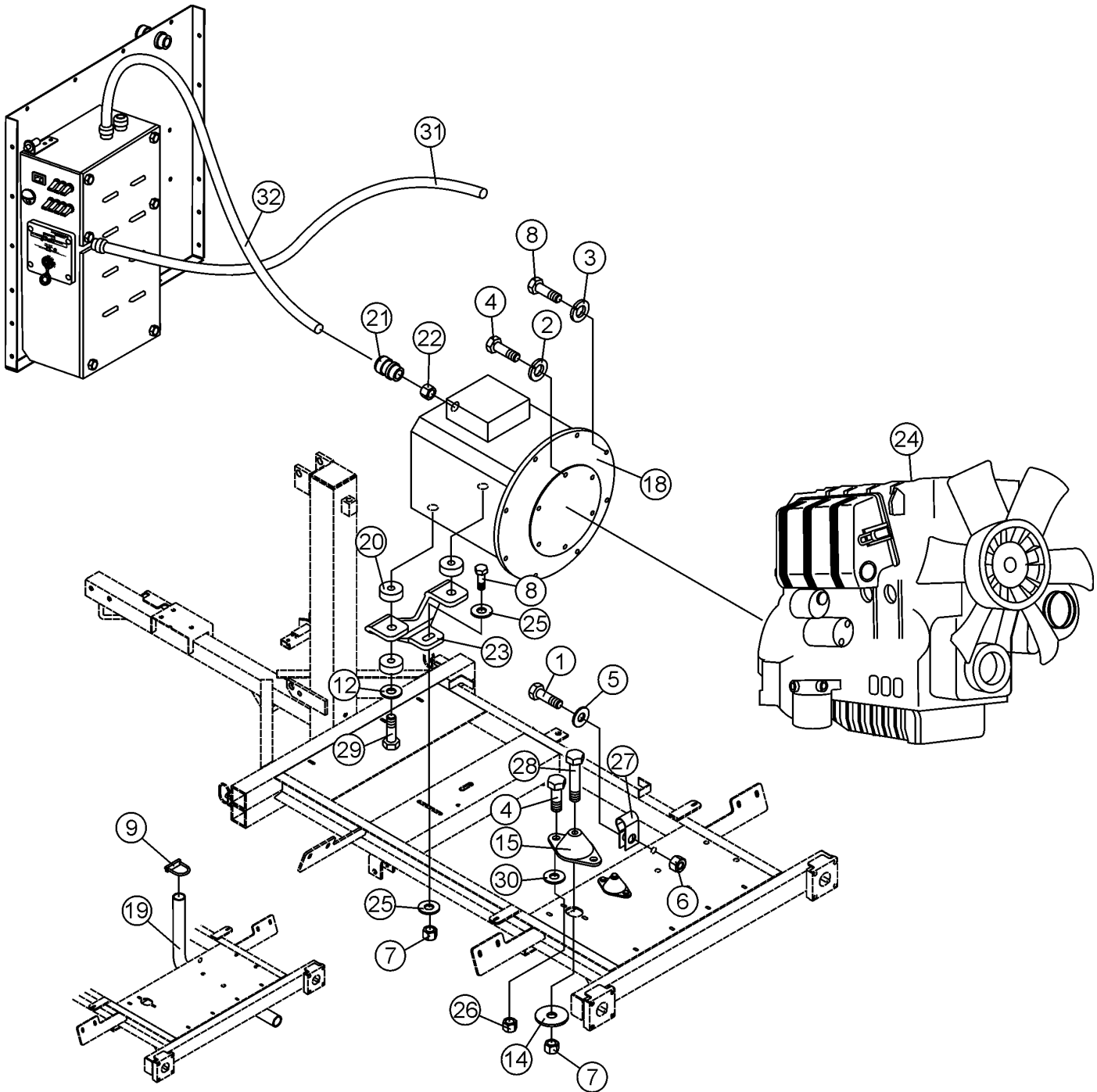
<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1*	29643	GENERATOR, MECC ALTE 6KW	1	103.10/MEC A 6KW
2	0161 C	WASHER, LOCK 5/16 MED	6	
3	0655	SCREW, HHC 5/16-18 x .75	6	
4	0166 A	WASHER, LOCK 3/8 MED	8	
5	1023	SCREW, HHC 3.8-16 x 1-1/4 GR 5	9	
6	29656	LOCKNUT, NYLON HEYCO 8465	1	
7	29655	FITTING, STRAIN RELIEF HEYCO 3234	1	
8	TBD	HOSE, STRAIN RELIEF FITTING	1	
9	29684	SUPPORT, MECC ALTE GENERATOR	1	
10	29649	MOUNT, VIBRATION KORFUND RB1-200	4	
11	19470	WASHER, FLAT 5/16 USS	2	
12	9182	SCREW, HHC M8-1.25 X 45MM PLATED	2	
13	4001	WASHER, FLAT USS 3/8 PLD	6	
14	10133	NUT, NYLOC 3/8-16	3	
15	4370	SCREW, HHC 3/8-16 x 2.25	2	
16	29609	EXHAUST PIPE, PERKINS 103	1	
17	10855	CLAMP, 1-1/2 MUFFLER	1	
18	19473	CLAMP, HOSE WORM 1/4 - 5/8 SIZE 4	6	
19	21544	CLAMP, 2-3/16 ID J&M PROD JM54LC1SZ355	1	
20	0131 A	SCREW, 1/4-20 x 3/4 IN.	1	
21	0948	WASHER, FLAT SAE 1/4	1	
22	10024	NUT, NYLOC 1/4-20	1	
23	29708	HOSE, PERKINS AIR INTAKE 2" X 36"	1	
24	29608	ENGINE/GEN. SET, PERKINS 103.10 MEC 61KW ...	1	INCLUDES ITEMS W/*



Use Blue Loctite (P/N: 60091) on all screws mounting generator to engine without locknuts.

LT-12 SERIES LIGHT TOWER — GENERATOR & ENGINE MOUNTS (DEUTZ)

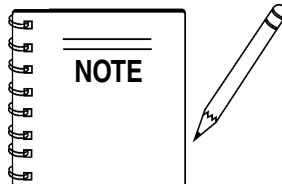
GENERATOR & ENGINE MOUNTS (DEUTZ)



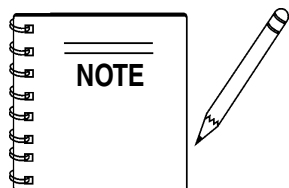
LT-12 SERIES LIGHT TOWER — GENERATOR & ENGINE MOUNTS (DEUTZ)

GENERATOR & ENGINE MOUNTS (DEUTZ)

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	0131 A	SCREW, HHC 1/4-20 X 3/4 IN.	1	
2	0161 C	WASHER, LOCK 5/16 MED	6	
3	0166 A	WASHER, LOCK, 3/8 MED.	8	
4	0202	SCREW, HHC 5/16-18 x 1 IN.	10	
5	0948	WASHER, FLAT SAE 1/4	1	
6	10024	NUT, NYLOC 1/4-20	1	
7	10133	NUT, NYLOC 3/8-16	3	
8	1023	SCREW, HHC 3/8-16 X 1 1/4 GR 5	9	
9	10855	CLAMP, 1-1/2 MUFFLER	1	
10	11978	FITTING, BARBED 3/16 TO 1/4 HOSE	1	
11	19303	CABLE, BATTERY POS 4GA X 48" POST	1	
12	19470	WASHER, FLAT 5/16 USS	2	
14	29043-001	WHEEL, POINTER .41IDx2.00OD C.SAW	2	
15	29269	MOUNT, VIBRATORY ENGINE	2	
17	29532	FRAME, DLT W/A	1	
18	29643	GENERATOR, MECC ALTE 6KW	1	
19	29645	EXHAUST PIPE, LOMBARDINI 1003	1	
20	29649	MOUNT, VIBRATION KORFUND RB1-200	2	
21	29655	FITTING, STRAIN RELIEF HEYCO 3234	1	
22	29656	LOCKNUT, NYLON HEYCO 8465	1	
23	29684	SUPPORT, MECC ALTE GENERATOR	1	
24	29699	ENGINE, DEUTZ F3L1008F	1	
25	4001	WASHER, FLAT USS 3/8 PLD	2	
26	5283	NUT, NYLOC 5/16-18	4	
27	11505	CLAMP, HOSE SUPPORT 1/2" LARGE	1	
28	8156	SCREW, HHC 3/8-16 x 2.5	2	
29	9182	SCREW, HHC M8-1.25 X 45MM PLATED	2	
30	0300 B	WASHER, FLAT SAE 5/16	4	
30	TBD	HOSE, STRAIN RELIEF FITTING	1	
31	TBD	HOSE, ENGINE WIRING	1	



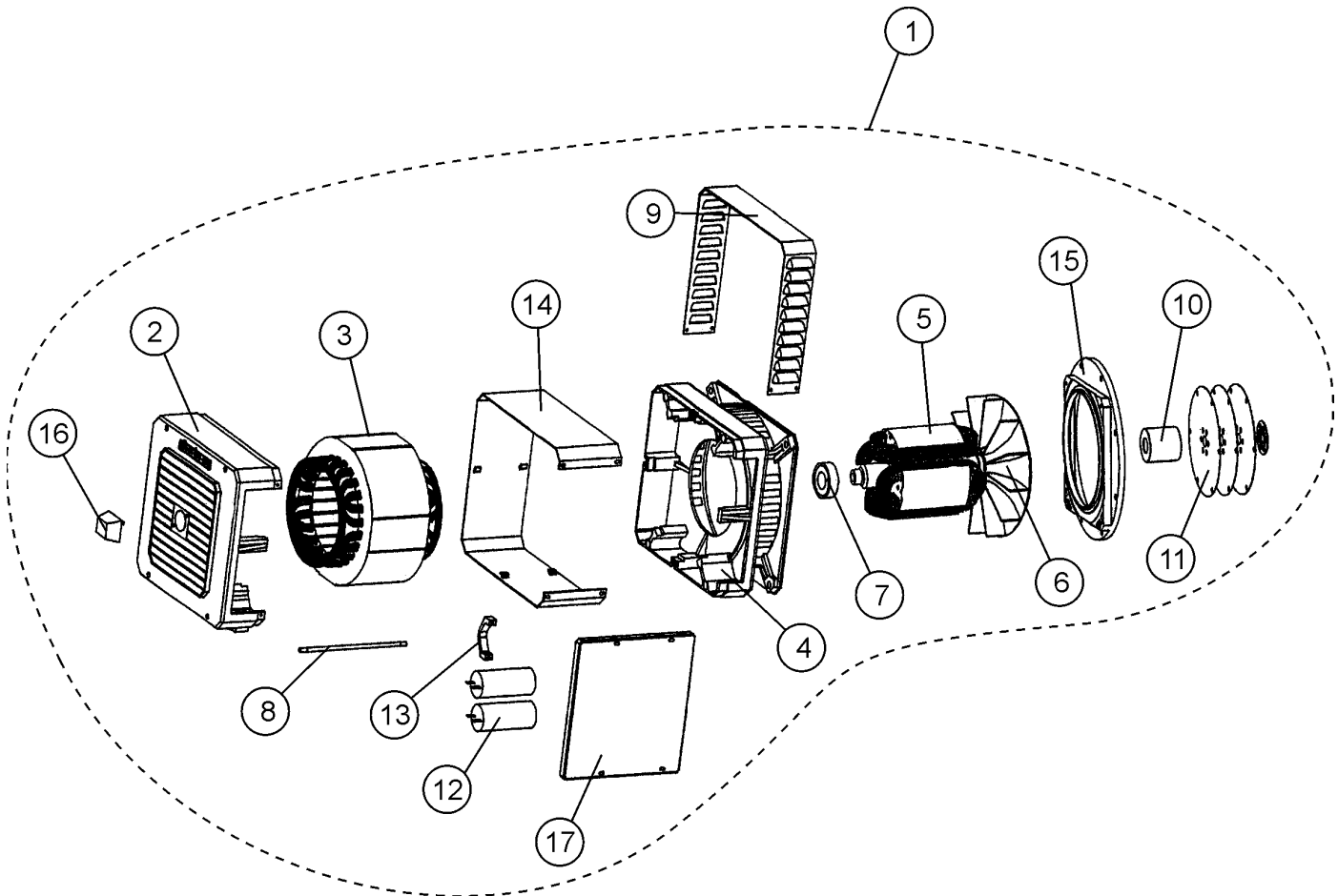
Use Blue Loctite (P/N: 60091) on all screws mounting generator to engine without locknuts.



Lombardini Engines use the same parts listed on this assembly drawing.

LT-12 SERIES LIGHT TOWER — GENERATOR ASSY.

GENERATOR ASSY.



LT-12 SERIES LIGHT TOWER — GENERATOR ASSY.

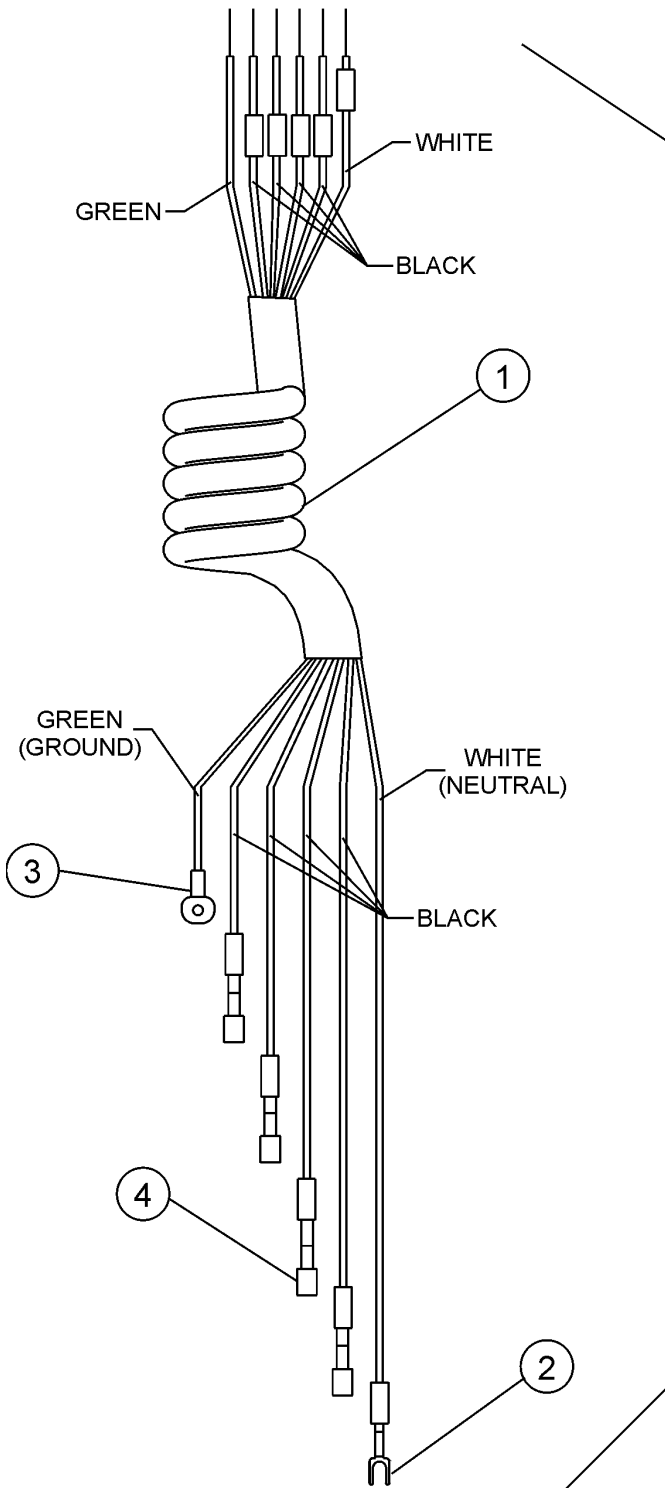
GENERATOR ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29643	GENERATOR ASSY.	1	
2	0390302207	COVER, REAR	1	
3	4500491504	STATOR 130/4	1	
3	4500491510	STATOR 180/4	1	
4	0391700135	COVER, FRONT	1	
5	4500561290	ROTOR 130/4	1	
5	4500561300	ROTOR 180/4	1	
6	0392000017	FAN	1	
7	0390302511	BEARING, REAR	1	
8	TBD	BOLT, COVER SECURING	4	
9	0390601031	BAND, PROTECTION IP23	1	
10	6102335005	HUB, COUPLING	1	
11	6110611180	DISC PLATE SAE 6,5	3	
11	6110611182	DISC PLATE SAE 7,5	3	
12	TBD	CAPACITOR	2	
13	9909505300	BRACKET	2	
14	9909512155	LOCKING BAND, PLASTIC 130/4	1	
14	9903905132	LOCKING BAND, METAL 130/4	1	
14	9903905134	LOCKING BAND, METAL 180/4	1	
15	6102332037	FLANGE, INTERCHANGEABLE	1	
16	0391802005	PLUG, TERMINAL BOX	1	
17	9910359005	DIODE	1	NOT SHOWN

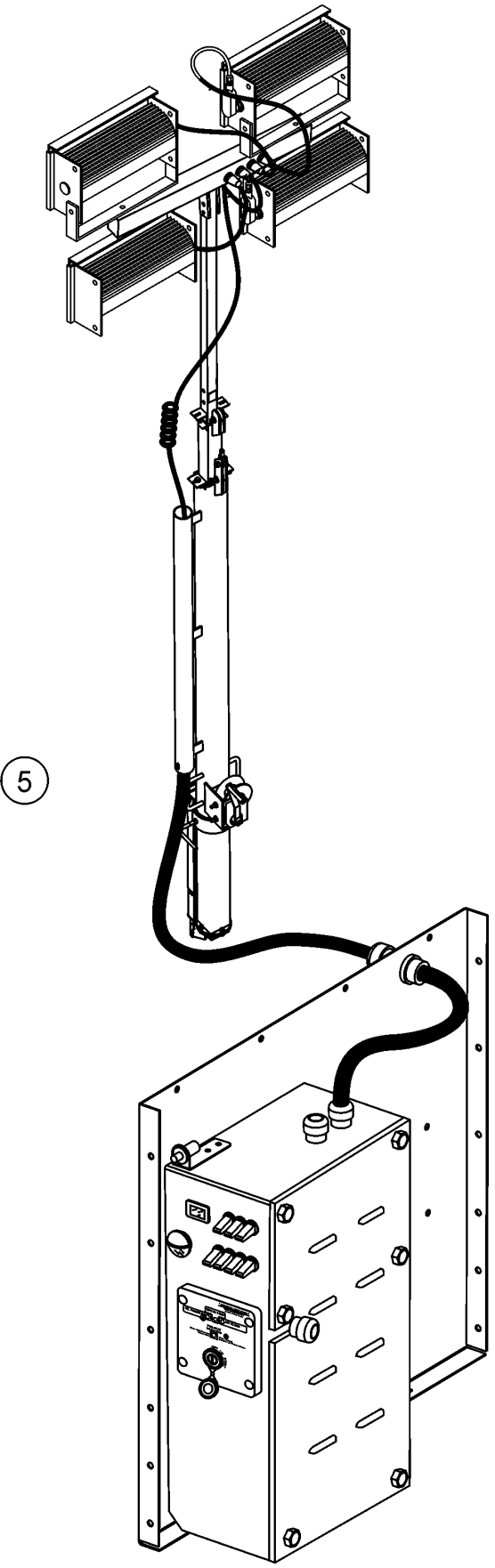
LT-12 SERIES LIGHT TOWER — COIL CORD ASSY.

COIL CORD ASSY.

CONNECT TO T-BAR ASSEMBLY
(FLOODLIGHTS)



CONNECT TO BALLAST
BOX OUTPUT



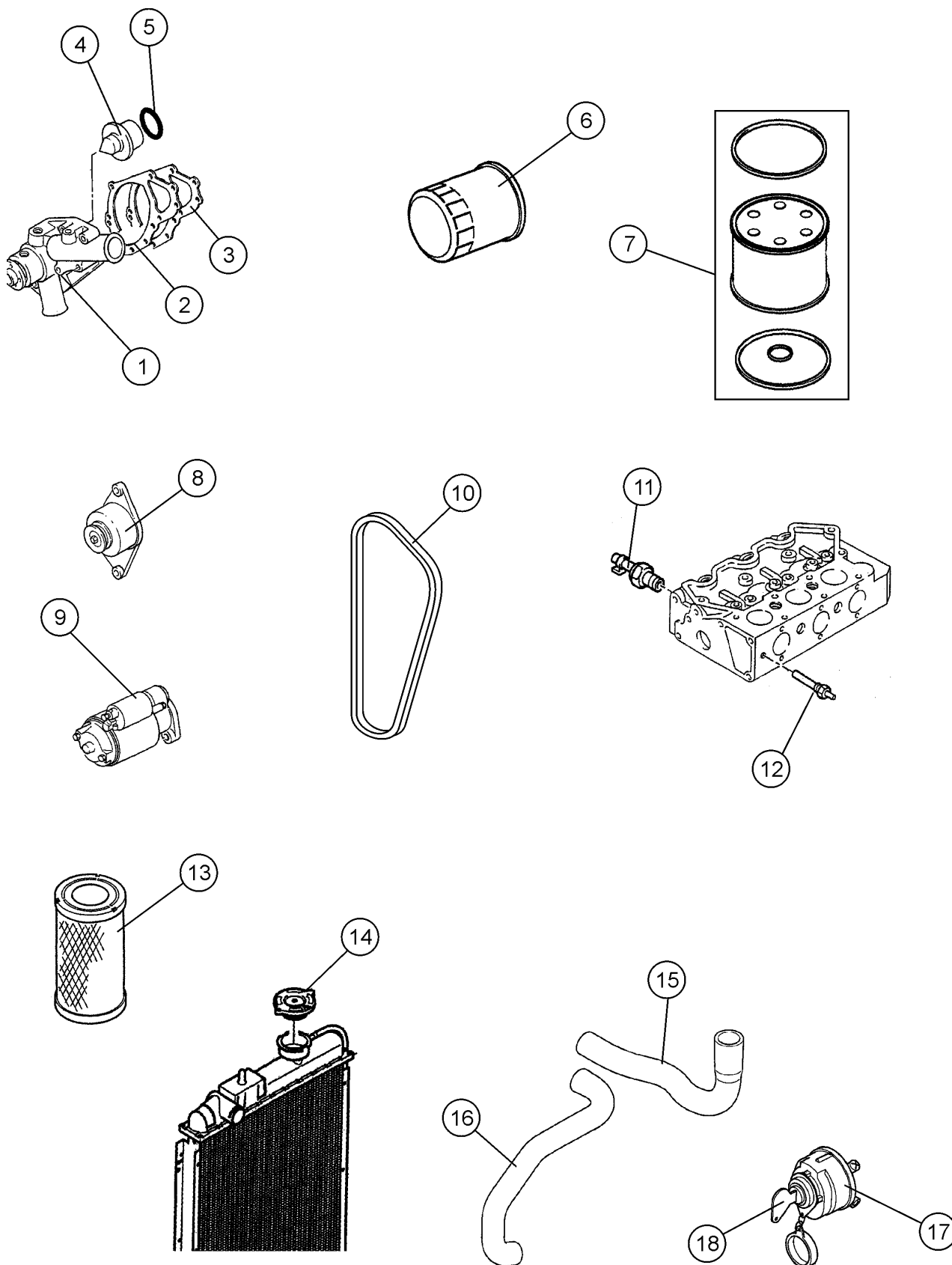
LT-12 SERIES LIGHT TOWER — COIL CORD ASSY.

COIL CORD ASSY.

NO	PART NO	PART NAME	QTY.	REMARKS
1*		COIL CORD	1	NOT SERVICED SEPERATELY
2*	10104	TERMINAL, SPADE 12-10, #10 INS	1	
3*	3254	TERMINAL, RING 16-14 3/8	1	
4*	11947	TERMINAL, FEM PUSH, 16-14 INSUL	4	
5	19955	COIL CORD ASSY.....	1	INCLUDES ITEMS W/*

LT-12 SERIES LIGHT TOWER — PERKINS ENGINE STOCKED PARTS ASSY.

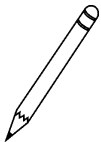
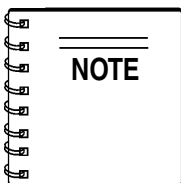
PERKINS ENGINE STOCKED PARTS ASSY.



LT-12 SERIES LIGHT TOWER — PERKINS ENGINE STOCKED PARTS ASSY.

PERKINS ENGINE STOCKED PARTS ASSY.

<u>NO</u>	<u>PART NO</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	145016474	WATER PUMP	1	
2	145996660	JOINT, GASKET	1	
3	145996650	JOINT, GASKET	1	
4	145206210	THERMOSTAT	1	
5	145996590	SEAL, THERMOSTAT	1	
6	140517000	FILTER, OIL	1	
7	26560017	FILTER ELEMENT KIT, FUEL	1	
8	185086610	STARTER ASSY	1	
9	185046160	ALTERNATOR	1	
10	80109049	VBELT, FAN	1	
11	185246060	SWITCH, OIL	1	
12	385720101	SENDER, OIL	1	
13	36510362	ELEMENT, AIR FILTER	1	
14	24850072	CAP, RADIATOR	1	
15	3483H043	HOSE, RADIATOR LOWER	1	
16	3483H034	HOSE, RADIATOR UPPER	1	
17	385201160	SWITCH, IGNITION	1	
18	385210060	KEY, IGNITION	1	



Multiquip only stocks the parts listed above. For all other engine components, contact your local Perkins Dealer.

Effective: October 1, 2002**TERMS AND CONDITIONS OF SALE — PARTS****PAYMENT TERMS**

Terms of payment for parts are net 10 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

OPERATION & PARTS MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER *ON-HAND* WHEN CALLING

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave. Tel: (800) 421-1244
Carson, CA 90746 Fax (800) 537-3927
Contact: mq@multiquip.com

Mayco Parts

800-306-2926 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Service Department

800-421-1244 Fax: 310-537-4259
310-537-3700

MQ Parts Department

800-427-1244 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Warranty Department

800-421-1244, Ext. 279 Fax: 310-537-1173
310-537-3700, Ext. 279

Technical Assistance

800-478-1244 Fax: 310-631-5032

MEXICO

MQ Cipsa

Carr. Fed. Mexico-Puebla KM 126.5 Tel: (52) 222-225-9900
Momoxpan, Cholula, Puebla 72760 Mexico Fax: (52) 222-285-0420
Contact: pmastretta@cipsa.com.mx

CANADA

Multiquip

4110 Industriel Boul. Tel: (450) 625-2244
Laval, Quebec, Canada H7L 6V3 Fax: (450) 625-8664
Contact: jmartin@multiquip.com

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Ashton-under-Lyne, Fax: 0161 339 3226
Lancashire OL7 0TL
Contact: sales@multiquip.co.uk

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Multiquip

Av. Evandro Lins e Silva, 840 - grupo 505 Tel: 011-55-21-3433-9055
Barra de Tijuca - Rio de Janeiro Fax: 011-55-21-3433-9055
Contact: cnavarro@multiquip.com.br, srentes@multiquip.com.br

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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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Your Local Dealer is:



P/N: 29543