MALTA DYNAMICS
FALL PROTECTION & SAFETY

XSERIES
MOBILE GRABBER
BY MALTA DYNAMICS

MAINTENANCE MANUAL

INCLUDES SDS SHEETS & TROUBLESHOOTING GUIDE

X1240 X1250 X1260

The Malta Dynamics Mobile Grabber Maintenance Manual

These instructions apply to the following model(s): X1240, X1250, & X1260

Manual Revision Date: 10 May 2021

Please visit www.MaltaDynamics.com for the latest user instruction manual revision available for this product offering as well as supporting documentation.

Maintenance Manual

Includes SDS Sheets

&

TROUBLESHOOTING GUIDE

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OWNERS INSPECTION RECORD

It is the responsibility of the owner to arrange inspection per the schedule found inside the Malta Dynamics Mobile Grabber manual. The schedule, as well as the info found in this manual, is subject to change without notice. Please visit our website at www.MaltaDynamics.com or contact the manufacturer for the latest information regarding the XSeries Malta Dynamics Mobile Grabber.

MAINTENANCE & SERVICE SAFETY TIPS

Maintenance and repair should only be performed by personnel who are trained and qualified to service this aerial platform.

All maintenance and service procedures should be performed in a well-lighted and well-ventilated area.

Anyone operating or servicing this equipment must read and completely understand all operating instructions and safety hazards in this manual and operating manual.

All tools, supports and lifting equipment to be used must be of proper rated load and in good working order before any service work begins. Work area should be kept clean and free of debris to avoid contaminating components while servicing.

All service personnel must be familiar with employer and governmental regulations that apply to servicing this type of equipment.

Keep sparks and flames away from all flammable or combustible materials.

Properly dispose of all waste material such as lubricants, rags, and old parts according to the relative law provisions obtaining in the country.

Before attempting any repair work, turn Battery Disconnect Switch to the “OFF” position.

Preventive maintenance is the easiest and least expensive type of maintenance.

REPLACEMENT PARTS

Use only original replacement parts. Parts such as batteries, wheels, railings, etc. with the weight and dimensions different from original parts will affect stability of the Malta Dynamics Mobile Grabber and must not be used without manufacturer's consent.

All replacement tires must be of the same size and load rating as originally supplied tires to maintain safety and stability of the XSeries.

ANCHOR POINTS

Inspect the anchor points of the Malta Dynamics Mobile Grabber for free rotation and corrosion. Make sure the bolt holding the anchor point to the mast is tight. If any deformation, rust, or defect is found in the anchor point, immediately remove from service and only replace with anchor points provided by the manufacturer.

Cleaning periodically will prolong the life and proper functioning of the anchor point. The frequency of cleaning should be determined by inspection and by severity of the environment. Clean with compressed air and/or a stiff brush using plain water or a mild soap and water solution. Do not use any corrosive chemicals that could damage the anchor point. Wipe all surfaces with a clean, dry cloth and allow to dry, or use compressed air.

BOLTS

The Malta Dynamics Mobile Grabber has several bolts and nuts used for securing pins, brackets, etc. Check the units bolts and nuts regularly for correct tightness. Torque specs are listed below and should be checked using a torque wrench or other properly calibrated measuring device.

- 1/4" (6.35mm)– 6ft/lbs. (8.13Nm)
- 5/16" (7.937mm)– 13ft/lbs. (17.63Nm)
- 3/8" (9.525mm)– 23ft/lbs. (31.18Nm)
- 7/16" (11.1125mm)– 37ft/lbs. (50.18Nm)
- 1/2" (12.7mm)– 57ft/lbs. (77.28Nm)
- 9/16" (14.2875mm)– 82ft/lbs. (111.18Nm)
- 5/8" (15.875mm)– 112ft/lbs. (151.85Nm)
- 3/4" (19.05mm)– 200ft/lbs. (271.16Nm)
- 7/8" (22.225mm)– 322ft/lbs. (436.57Nm)
- 1" (25.4mm)– 488ft/lbs. (661.64Nm)

Failing to check the fasteners of the unit can lead to undo stress to key components and lead to premature failure of critical members of the unit. If fasteners are found to be missing, immediately remove from service until replaced.

DEEP CYCLE BATTERY CARE & MAINTENANCE

- New batteries should be given a full charge before use.
- New deep cycle batteries need to be cycled several times before reaching full capacity (25-100 cycles, depending on type). Capacity will be limited during this period.
- Battery cables should be intact, and the connectors kept tight at all times. Always use insulated tools to avoid shorting battery terminals. Regular inspection is recommended.
- Vent caps should be correctly installed and tight during operation and charging.
- Batteries should be kept clean and free of dirt and corrosion at all times.
- Batteries should always be watered after charging unless plates are exposed before charging. If exposed, plates should be covered by approximately 1/8"(3.175mm) of electrolyte (add distilled water only). Check electrolyte level after charge. The electrolyte level should be kept 1/4"(6.35mm) below the bottom of the fill well in the cell cover.
- Water used to replenish batteries should be distilled or treated not to exceed 200 T.D.S. (Total Dissolved Solids... parts per million). Particular care should be taken to avoid metallic contamination (iron).
- For best battery life, batteries should not be discharged below 80% of their rated capacity.
- Avoid charging at temperatures above 120°F (49°C) or ambient, whichever is higher. Deep cycle batteries need to be equalized periodically. Equalizing is an extended, low current charge performed after the normal charge cycle. This extra charge helps keep all cells in balance. The onboard charger does this automatically. Plugging the charger in at a minimum of monthly will ensure proper battery equalization.
- Periodic battery testing is an important preventative maintenance procedure. Hydrometer readings of each cell (fully charged) gives an indication of balance and true charge level. Imbalance could mean the need for equalizing, and often is a sign of improper charging or a bad cell. Voltage checks (open circuit, charged and discharged) can locate a bad battery or weak battery. Load testing will pick out a bad battery when other methods fail. A weak battery will cause premature failure of companion batteries.
- As batteries age, their maintenance requirements change. This means longer charging time and/or higher finish rate (higher amperage at

the end of the charge). Usually older batteries need to be watered more often…and their capacity decreases.

- Lead acid batteries should be brought up to full charge at the earliest opportunity. Avoid continuously operating batteries in a partially charged condition. This will shorten their life and reduce their capacity.
- Extreme temperatures can substantially affect battery performance and charging. Cold reduces battery capacity and retards charging. Heat increases water usage and can result in overcharging. Very high temperatures can cause "thermal run-away" which may lead to an explosion or fire. If extreme temperature is an unavoidable part of an application, consult a battery/charger specialist about ways to deal with the problem.
- Inactivity can be extremely harmful to all lead acid batteries. If season use is anticipated, we recommend the following:

    - Completely charge the battery before storing.
    - Remove all electrical connections from the battery.
    - Store the battery in as cool a place as possible. However, do not store in a location which will consistently be below 32 degrees F. Batteries will discharge when stored, the lower the temperature the lower the self-discharge.
    - When not in use, boost every two months.

BATTERY CHARGER

The battery charger in the Malta Dynamics Mobile Grabber requires no normal maintenance. It should be kept clean and dry. If you do experience an issue, below is a trouble shooting guide.

BATTERY TROUBLESHOOTING

Symptom	Cause	Corrective Action
When plugged into AC power the LED flashes red/green.	Connected reverse to battery, or not connected to battery.	Correct polarity or connect to battery. Have a qualified person make repair. Replace.
When plugged into AC power the LED does not come on.	No AC power.	Check circuit. Check extension cord for breaks or damage.
When I put a volt meter across the output of the charger there is no power coming out when I plug it in.	Battery too dead to charge.	
The batteries don't receive a full charge. On wet cells, the specific gravity will not rise to a full reading after the charge has completed.	The charger must be connected to a battery to turn on.	Check that the charger's output is about 10% of the amp hour rating of the battery. Recheck the dip switch setting. If in doubt, contact us. If you have a 4 position switch, switch #1 positon ON. Replace.
When switched on, the LED flashes red/yellow.	The charger is too small for the battery. The charger profile is not set correctly. The cycle needs more time. The battery is defective.	Connect the charger to a battery(s) with the same voltage rating.
When powered up the LED is solid red with a yellow flash.	Charger and battery voltage mismatch.	Leave connected, it may take hours, but if the voltage rises even a little bit, it should recover, and turn the charger full on. (Do not allow your batteries to deep discharge, it is the number one cause of premature battery failure.)
The charger blows its fuse, or branch circuit fuse/circuit breaker as soon as it's switched on.	The battery is very low, and the charger is in a slow charge phase until the voltage rises to a safe level before full turn on.	Contact factory.
The charger blows the branch circuit fuse/circuit breaker a short while after being switched on.	The branch circuit is too small.	Relocate charger to a branch circuit with a heavier rating, or remove other loads on the circuit
Batteries use water, get hot, or smell.	One or more dead cells Dip switch not set correctly.	Replace batteries. If charging in a series string, it is best to replace all the batteries rather than mix new with old. If shallow discharging, check that the dip switch is not set to standard, or extended cycle.
After a full charge, the batteries die quickly.	The batteries are sulfated.	Sometimes batteries can be recovered. Leave the charger on for some hours, if the voltage falls and the current begins to rise, it is a good sign they can recover under normal charging.
After a full charge, the LED is green with a yellow flash.	The batteries did not reach 80% charge in 12 hours, or did not reach minimum voltage, and the charger timed out.	The charger is too small for the batteries. Batteries are beginning to age.

MAIN POWER SWITCH

The main power switch is a fast, effective way to disengage power from the hydraulics that power the unit. To test, simply interrupt an operation of the unit and turn the switch to off. This should immediately disengage the power. If it does not, immediately remove from service and replace the main power switch.

REMOTE CONTROL

Visually inspect the remote for broken switches, cracked case, or cut or frayed wires. Turn the main power switch to “ON” position and operate all buttons on the remote. While using one of the buttons, depress the Emergency switch to ensure it is functioning. If there is any failure, do not attempt to repair. Immediately replace the control by contacting the manufacturer.

GREASE FITTINGS

There are Zerk style grease fittings located at the mast pivot points as well as on the leveling jacks. Using a grease gun, apply grease until it just begins to seep from around the pivot points. Remove any excess grease as this may collect dust and cause unwanted wear. Properly greasing these points are key to years of service from the unit.

HYDRAULICS

When adding or replacing fluid, use Mobil Nuto H32 or equivalent fluid.

Start by checking the tank for cracks or signs of leaks. Excess fluid inside the motor box can hint at this. Make sure the fluid levels are maintained at the correct level. Inspect the connection point of the tank and the hydraulic pump. Make sure all bolts and fittings are tight, including the electrical connections. Check the manifold for leaks and be sure that all lines and fittings are tight. Check hoses and lines for cracks, burns, bulges, or potential leaks. Inspect the cylinder casing for dings, dents, or punctures. Inspect the cylinder rod for dings, unusual scrapes, and bends.

Your Malta Dynamics Mobile Grabber is equipped with a hydraulic filter inside the motor box. This filter is available from the manufacturer and should be replaced every 6 months.

HYDRAULIC SYSTEM & COMPONENT MAINTENANCE & REPAIR

The following points should be kept in mind when working on the hydraulic system or any components:

1. Any structure has limits of strength and durability. To prevent failure of structural parts of hydraulic components, relief valves which limit pressure to safe operating values are included in the hydraulic circuits.
2. Tolerance of working parts in the hydraulic system is very close. Even small amounts of dirt or foreign materials in the system can cause wear or damage to components, as well as general faulty operation of the hydraulic system. Every precaution must be taken to assure absolute cleanliness of the hydraulic oil.
3. Whenever there is a hydraulic system failure which gives reason to believe that there are metal particles or foreign materials in the system, drain and flush the entire system and replace the filter cartridges. A complete change of oil must be made under these circumstances.
4. Whenever the hydraulic system is drained, check the magnets in the hydraulic reservoir for metal particles. If metal particles are present, flush the entire system and add a new change of oil. The presence of metal particles also may indicate the possibility of imminent component failure. A very small amount of fine particles is normal.
5. All containers and funnels used in handling hydraulic oil must be absolutely clean. Use a funnel when necessary for filling the hydraulic oil reservoir, and fill the reservoir only through the filter opening. The use of cloth to strain the oil should be avoided to prevent lint from getting into the system.
6. When removing any hydraulic component, be sure to cap and tag all hydraulic lines involved. Also, plug the ports of the removed components.

NOTE:

Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use.

MANUAL

Check the Manual tube and make sure the most recent copy of the Malta Dynamics Mobile Grabber manual is inside. Copies are available online at www.MaltaDynamics.com and from the manufacturer.

LABELS & DECALS

It is important that all labels and decals on the XSeries are both present and legible. Inspect the unit labels for this regularly. If you find a label is damaged or missing, contact the manufacturer for replacement decal kits.

When installing new labels and decals, be sure to first clean away any residue from the old label as well as any grease, grime or dirt. This can be done by denatured alcohol. Be sure the surface is completely dry before applying the label.

TOWING COUPLER

To insure the Malta Dynamics Mobile Grabber coupler gives you years of uninterrupted service, check to make sure that the latching mechanism moves into the locked and unlocked position freely. If you should find that the latch mechanism is not operating properly, IMMEDIATELY remove from service and contact the manufacturer.

The receiver latch mechanism should be greased with a light oil lubricant and be kept free of rust and dirt. Make sure that all moving components are lubricated. Be sure to check for cracks both in the components of the receiver as well as the weld or attachment points to the frame. Again, if any cracks or breaks are detected, IMMEDIATELY remove from service and contact manufacturer.

WHEELS & TIRES

Before towing, always check the pressure recommended by the manufacturer. You can find this printed on the sidewall of the tire.

Tire pressures are always given for COLD tires. Check tires in the morning or after they have been sitting for a long period. Driving heats up the tires and causes the air inside to expand, which makes readings several pounds higher.

Use an accurate tire gauge. The built-in gauge on an air hose or compressor at gas stations is often wrong.

You can add or release air from the valve stem until your tire's pressure matches the recommended pressure.

To let air out, press down on the needle in the middle of the valve. Most gauges have a small knob for this, but you can use a pen or nail as well.

When replacing tires, be sure to use tires of the same size and load rating. The tires are selected specifically for the load requirements of the unit and should not be deviated from.

TORQUE REQUIREMENTS

It is extremely important to apply and maintain proper wheel mounting torque on your trailer axle. Torque wrenches assure the proper amount of torque is being applied to a fastener. Use no other method to torque fasteners.

WARNING

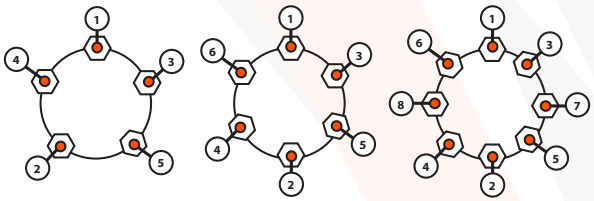
Proper and accurate torque must be maintained to prevent wheels from loosening, studs from cracking and/or breaking or other possible hazardous breakage resulting in death or serious injury.

Be sure to use only the fasteners matched to the cone angle of your wheel (usually 60°F (15.56°C) or 90°F (32.22°C)). The proper procedure for attaching your wheels is as follows:

1. Start all bolts or nuts by hand to prevent cross threading.
2. Tighten bolts or nuts in the following sequence (see Wheel Torque Requirement Chart below).
3. Tightening fasteners should be done in stages. Follow the recommended sequence, tighten fasteners per wheel torque requirements chart below.
4. Wheel nuts/bolts should be torqued before first road use after each wheel removal. Check and re-torque after the 10 miles (16km) and 25 miles (40km) and again at 50 miles (80.5km). A periodic check during regular service is recommended.

Wheel Torque Requirment Chart

Wheel Size	Stud Size	Torque Sequence		
		1st Stage	2nd Stage	3rd Stage
15" (381mm)	1/2" (12.7mm)	20-25 ft.-lbs. (27.1Nm - 33.9Nm)	50-60 ft.-lbs. (67.8Nm - 81.35Nm)	90-120 ft.-lbs. (122Nm - 162.7Nm)
16" (406.4mm)	1/2" (12.7mm)	20-25 ft.-lbs. (27.1Nm - 33.9Nm)	50-60 ft.-lbs. (67.8Nm - 81.35Nm)	90-120 ft.-lbs. (122Nm - 162.7Nm)
16.5"x6.75" (419.1mm x 171.45mm)	1/2" (12.7mm)	20-25 ft.-lbs. (27.1Nm - 33.9Nm)	50-60 ft.-lbs. (67.8Nm - 81.35Nm)	90-120 ft.-lbs. (122Nm - 162.7Nm)
16" (406.4mm)	9/16" (14.3mm)	20-25 ft.-lbs. (27.1Nm - 33.9Nm)	60-70 ft.-lbs. (81.35Nm - 94.9Nm)	120-130 ft.-lbs. (162.7Nm - 176.3Nm)



BREAK-IN PERIOD FOR ELECTRIC DRUM BRAKES

The break in period is a typical phenomenon with drum brakes and especially electric drum brakes. Electric drum brakes will require a break-in period to achieve full performance. This break-in period applies for new axles and any time new brake shoes and/or magnets are installed as part of regular maintenance. Lippert Components has found through extensive brake testing that the break-in period for our drum brakes can range from 20 to 50 brake applications. Brakes can be seated in by applying approximately 8-10 volts to the trailer brakes at an initial speed of 40 mph (64.45mm) and allowing the truck/trailer combination to slow down to 20 or 25 mph (32 or 40kmph). For best results do not use truck brakes during this procedure. The trailer brakes will seat in faster by using them to stop both the truck and trailer. The easiest method is to apply the trailer brakes using the manual activation lever located on the in-cab brake controller. Care must be taken to not overheat the lining material, therefore brake applications conducted at one mile intervals will suffice. The driver should feel a noticeable difference in the brake performance during this period, sometimes in as few as 10 applications. After 50 applications, the brake lining material will be fully cured from the heat and develop close to 100% contact with the brake drum surface.

This break-in period not only seats the shoe lining material but also seats in the brake electromagnets. During the break-in period, the linings will wear at a faster rate than they do after they are seated in.

NOTE: Brake should be manually adjusted after the first 200 miles (322km) of operation and periodically thereafter, approx. 3,000-mile (4828km) intervals.

ADVANCED:

Turn the gain on the trailer brake controller to the maximum level. Proceed to a driving highway speed of 60-70 mph, not exceeding posted speed limits. Move the sliding mechanism on the trailer brake controller to apply the trailer brakes while maintaining the posted highway speed, without locking up the trailer brakes. Continue with the trailer brakes applied while maintaining the posted speed limit for one half mile. Release the sliding mechanism on the break controller. This may result in the brake or axle area starting to smoke, which is a normal result in the burnishing procedure. An ideal temperature for the brakes during this process is between 350 and 400degrees Fahrenheit. If the brakes are not heating up, please repeat this process.

HUB REMOVAL

To remove the hub assembly for inspection, maintenance or service, follow the six (6) steps below:

WARNING

Lift unit by the frame and never the axle or suspension. Do not go under the unit unless it is properly supported by jack stands. Unsupported units can fall causing death or serious injury.

1. Lift trailer and support it per manufacturer's requirements.
2. Remove the wheel.
3. Remove the grease cap by prying the edge out of the hub. If equipped with oil lubrication, unscrew oil cap using a 2 1/2" (63.5mm) socket. Let oil drain into the pan.
4. Pull the cotter pin from the castle nut and remove the outer spindle nut.
5. Remove the spindle washer.
6. Pull the hub off the spindle. Do not let the outer bearing cone fall free of the assembly. The inner bearing cone will be contained by the seal and will not fall out.

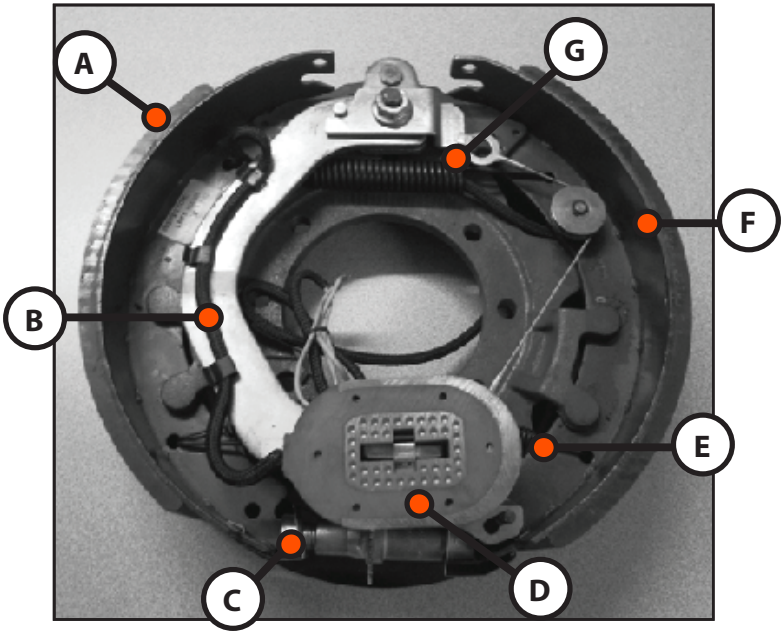
NOTE: Brakes may need to be adjusted or backed off to remove drum from spindle.

NOTE: A gear puller may be necessary to remove hub from spindle.

BRAKE DRUM INSPECTION

The brake shoes contact the drum surface and the magnet contacts the armature. These surfaces are subject to wear and should be inspected periodically. The drum surface should be re-machined if wear is more than .030" (7.62mm) or out of round by more than .015" (.381mm). The drum should be replaced if scoring or wear is greater than .090" (2.286mm). The inner surface of the brake drum that contacts the brake magnet is the armature surface. If the armature surface is scored or worn unevenly, it should not be machined more than 0.30" (7.62mm). The magnets should be replaced whenever the armature surface is refaced and vice versa.

NOTE: Ensure that the wheel bearing cavities are clean and free of contamination before reinstalling bearing and seals. Resurfacing procedures can produce metal chips and dust that can contaminate the wheel bearings and cause failure.



Callout Description:

A. Primary Shoe
B. Actuating Lever
C. Adjuster
D. Magnet
E. Adjusting Spring
F. Secondary Shoe
G. Retracting Spring

BEARING INSPECTION

Drum	Maximum Re-bore Diameter
7” (177.8mm)	7.09” (180.086mm)
10” (255mm)	10.09” (256.286mm)
12” (304.8)	12.09” (307.086mm)

Wash all grease and oil from the bearing cone using a suitable solvent. Dry the bearing with a clean, lint-free cloth and inspect each roller completely. If any pitting, spalling, or corrosion is present, then the bearing must be replaced. The bearing cup inside the hub must be inspected.

NOTE: Bearings must always be replaced in sets of one cone and one cup.

WARNING

Always wear eye protection when servicing the axle, brakes, hubs, springs and wheels. Failure to wear eye protection may result in serious injury.

Follow the procedure below to replace the bearing cup:

1. Place hub on a flat surface with bearing cup on the bottom.
2. With brass drift punch, lightly tap around the small end of the cup to push it out.
3. Clean the hub bore. Replace the cup by tapping it back in with the brass drift punch. Cup should be seated against the retaining shoulder in the hub.

Consult Bearing Replacement Chart for proper replacement bearings.

NOTE: Replacing the bearing cup is a very precise process. The cup must be perfectly seated when replaced. If the cup is not seated correctly, damage to the assembly may not be covered by the warranty. Consult Lippert Components, Inc. prior to replacing bearing and bearing cup. The trailer should be taken to a certified service center for this work to be done.

WARNING

Do not mix lithium, calcium, sodium or barium complex greases. Chemical compatibility problems may occur. If you are changing from one chemical grease to another, be sure all old grease is removed prior to applying new grease. If the old grease is not removed completely, chemical compatibility may result in component failure or damage.

BEARING LUBRICATION – GREASE

Bearing grease should be replaced every 12,000 miles (19312km) or 12 months, whichever comes first. Remove all old grease from wheel hub and bearings first. Bearings should be packed by machine if possible. Packing bearings by machine is preferable; however, packing by hand is a viable alternative.

Follow these procedures to repack bearings by hand:

1. Place grease into the palm of your hand.
2. Press widest end of bearing into the outer edge of the grease pile, forcing grease into the inner area of the bearing between two adjacent rollers.
3. Repeat this process while turning bearing from roller to roller until all rollers are coated.
4. Apply a light coat of grease into the bearing cup surface.
5. Reassemble bearing into cup.

Recommended Wheel Bearing Grease Specifications	
Thickener Type	Lithium Complex
Dropping Point	230°C (446°F) Minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion, & Oxidation Inhibitors
Base Oil	Solvent Refined Petroleum Oil
Base Oil Viscosity	@40°C (104°F) 150cSt (695 SUS) Minimum
Viscosity Index	80 Minimum
Pour Point	-10°C (14°F) Minimum
Approved Sources	
Mobil Oil	Mobilgrease HP
Exxon/Standard	Ronex MP
Kendal Refining Co.	Kendall L-427
Ashland Oil Co.	Valvoline Val-plex EP Grease
Pennzoil Prod. Co.	Premium Wheel Bearing Grease 707L

RECOMMENDED WHEEL BEARING GREASE

SPECIFICATIONS

Seal Inspection and Replacement

Always check the seal to make sure that it is not damaged, nicked, cracked or torn and is in good working order. If there is any question of condition, replace the seal.

Procedure to replace seal:

1. Pull seal from the hub with a seal puller. Never push the seal out with the bearing. The bearing may get damaged.
2. Apply a PERMATEX sealant to the outside of the new seal.
   NOTE: Do not use PERMATEX on rubber encased seals.
3. Tap the new seal into place using a clean, hardwood block.

NOTE: When installing a new oil seal, be sure the side marked “AIR SIDE” is away from bearing cone.

BEARING ADJUSTMENT/HUB REPLACEMENT

To adjust bearings or replace removed hub, follow procedure below

1. Place hub, bearing, washers and castle nut back on axle spindle in the reverse order from which they were removed. Castle nut should be torqued to 50 ft.-lb (67.79Nm). Hub will rotate during this process.
2. Loosen castle nut to back off the torque.
3. Tighten castle nut finger tight until snug.
4. Insert cotter pin. If cotter pin does not line up with the hole, back the castle nut up slightly until the pin can be inserted.
5. Bend cotter pin over to lock nut in place. Nut should be free to move with only the cotter pin keeping it in place.

GENERAL MAINTENANCE – ELECTRIC BRAKES
BRAKE ADJUSTMENT

WARNING

Prior to testing or adjusting brakes, be sure area is clear of any persons and vehicles. Failure to perform test in a clear area may result in death or serious injury.

Lippert Components, Inc. Electric Brakes are automatic adjust only. If manual adjusting is needed, the following 6-step procedure can be utilized. The brakes should be adjusted in the following manner:

Jack up trailer and secure on adequate capacity jack stands. Follow trailer manufacturer's recommendations for lifting and supporting the unit. Make sure the wheel and drum rotate freely.

WARNING

Lift unit by frame and never the axle or suspension. Do not go under unit unless it is properly supported by jack stands. Unsupported units can fall causing death or serious injury.

2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool, rotate the star wheel of the adjuster assembly to expand the brake shoes. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Then rotate the star wheel in the opposite direction until the wheel turns freely with a slight lining drag.

NOTE: A second screwdriver will be needed to push the auto adjusting lever away from the adjuster star wheel so that the star wheel can be rotated backwards.

5. Replace the adjusting hole cover and lower the wheel to the ground.

6. Repeat the above procedure on all brakes. For best results, the brakes should all be set at the same clearance.

LUBRICATE BRAKES

Prior to reassembling the brake drum assembly, remember to apply a light film of white grease or an anti-seize compound on the brake anchor pin, the actuating arm bushing and pin, and the areas on the backing plate that are in contact with the brake shoes and magnet lever arm. In addition, apply a light film of grease on the actuating block mounted on the actuating arm.

CLEAN AND INSPECT BRAKES

In the event the braking system encounters symptoms of improper application or failure, immediate inspection and service must be implemented. During normal use, servicing the braking system once a year is considered normal. Increased usage will require service on a regulated schedule based on 3000-6000-mile (4828km-9656km) increments. As magnets and shoes become worn, they need to be changed to maintain maximum braking capability.

Be sure, when disassembling brakes for cleaning, to clean the backing plate, magnet arm, magnet and shoes. Also, make sure that any and all parts removed for cleaning are placed back into the same brake drum assembly. This is also an excellent time to check for parts that have become loose or worn.

⚠ WARNING

Potential Asbestos Dust Hazard

Older brake linings have the potential to contain asbestos dust, which has been linked to serious or fatal illnesses. Certain precautions must be taken when servicing brakes:

1. Avoid creating and/or breathing any brake dust.
2. Do not machine, file, or grind the brake linings.
3. Remove with a damp brush or cloth. Dry brushing or compressed air will cause the dust particles to become airborne.

MANUFACTURER SAFETY DATA SHEETS

EXIDE TECHNOLOGIES

GHS
SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

MANUFACTURER/SUPPLIER Exide Technologies 13000 Deerfield Parkway, Bldg. 200 Milton, GA 30004	CHEMICAL/TRADE NAME (* as used on label)	*Lead-Acid Battery Non-spillable Valve Regulated Lead-Acid Battery (VRLA) Absorbed Electrolyte Battery
	PRODUCT ID	UN2800
FOR FURTHER INFORMATION Primary Contact: Exide SDS Support (770) 421-3485 Secondary Contact: Joe Bolea (423) 989-6377 Joe Kumper (678) 566-9380 Fred Ganster (610) 921-4052	CHEMICAL FAMILY/ CLASSIFICATION	Electric Storage Battery
	FOR EMERGENCY CHEMTREC (800) 424-9300 (703) 527-3887 – Collect 24-hour Emergency Response Contact Ask for Environmental Coordinator	

II. HAZARD IDENTIFICATION

Signal Word: Danger

Category:		GHS Codes	Description
		H302/H312/H332	Harmful if swallowed, inhaled, or in contact with skin.
		H314	Acid causes severe skin burns and eye damage.
		H315/H318	Causes skin irritation, serious eye damage.
		H302/H313/H332	Contact with internal components may cause irritation or severe burns.
		H350	May cause cancer if ingested or inhaled.
		H360	May damage fertility or the unborn child if ingested or inhaled.
		H373	Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure if ingested or inhaled.
Health:	**STOT RE 2**	H220	Extremely flammable gas (hydrogen). May form explosive air/gas mixture during charging.
	Acute Tox. 4		
	Repr. 1A	H203	Explosive, fire, blast or projection hazard.
	Skin Corr. 1A	H410	Very toxic to aquatic life with long lasting effects.
	Flamm Gas 1	P260	Do not breathe dust/fume/gas/mist/vapors/spray.
		P314	If exposed/concerned, or if you feel unwell seek medical attention/advice.
	Aquatic Acute 1	P301/330/331	**IF SWALLOWED OR CONSUMED:** rinse mouth. Do NOT induce vomiting. Call a poison center/doctor if you feel unwell.
	Aquatic Chronic 1	P303/361/353	**IF ON CLOTHING OR SKIN (or hair):** Remove/Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower.
		P304/340	**IF INHALED:** Remove person to fresh air and keep comfortable for breathing.
		P305/351/338	**IF IN EYES:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P311	Immediately call a **POISON CENTER** or doctor/physician.
		H362	May cause harm to breast-fed children.
Handling:		P201	Obtain special instructions before use.
		P202	Do not handle until all safety precautions have been read and understood.
		P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
		P263	Avoid contact during pregnancy/while nursing.
		P264	Wash thoroughly after handling.
		P270	Do not eat drink or smoke when using this product.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P403/P405	Store locked up, in a well-ventilated area, in accordance with local and national regulation.
		P271	Use only outdoors or in a well-ventilated area.
		P501	Dispose of contents/container in accordance with local & national laws.
		P201	Keep out of reach of children.

WARNING: Batteries subjected to abusive charging at excessively high currents for prolonged periods of time without vent caps in place may create a surrounding atmosphere of an offensive, strong inorganic acid mist containing sulfuric acid.

Reactivity: highly reactive with water and alkalis

III. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	*CAS Number*	*% by Wt.*
Inorganic compounds of Lead	7439-92-1	65-69
Electrolyte (no fluid/completely absorbed) sulfuric acid/water/solution	7664-93-9	17-30
Case Material: Polypropylene	9003-07-0	3-8
Separator:	N/A	1-3

Note:
Inorganic lead and electrolyte (water and sulfuric acid solution) are the primary components of every battery manufactured by Exide Technologies or its subsidiaries. Other ingredients may be present dependent upon battery type. Polypropylene is the principal case material of automotive and commercial batteries.

IV. FIRST AID MEASURES

Take proper precautions to ensure you own health and safety before attempting to rescue a victim and provide first aid.

Inhalation: Electrolyte: Remove to fresh air immediately. If breathing is difficult, give oxygen.
Lead compounds: Remove from exposure, gargle, wash nose and lips; consult physician.

Skin Contact: Electrolyte: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.
Lead compounds: Wash immediately with soap and water.

Eye Contact: Electrolyte and Lead compounds: Flush immediately with large amounts of water for at least 15 minutes; consult physician immediately
.

Ingestion: Electrolyte: Give large quantities of water; **do not** induce vomiting; consult physician.
Lead compounds: Consult physician immediately.

V. FIRE FIGHTING MEASURES

Flash Point: Not Applicable

Flammable Limits: LEL = 4.1% (hydrogen gas in air) ; UEL = 74.2%

Extinguishing media: CO_2; foam; dry chemical

Fire Fighting Procedures:
Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but, note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Hazardous Combustion Products:
In operation, batteries generate and release flammable hydrogen gas. They must always be assumed to contain this gas which, if ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery.

VI. ACCIDENTAL RELEASE MEASURES

Remove combustible materials and all sources of ignition. Stop flow of material and contain spill by diking with soda ash, etc. Carefully neutralize spill with soda ash, etc. Make certain mixture is neutral then collect residue and place in a drum or other suitable container with a label specifying "contains hazardous waste" or (if uncertain call distributor regarding proper labeling procedures). Dispose of as hazardous waste. If battery is leaking, place battery in a heavy duty plastic bag. Wear acid resistant boots, face shield, chemical splash goggles and acid resistant gloves. ***Do not allow discharge of acid to sewer.*** Acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

VII. HANDLING AND STORAGE

Handling:
Single batteries pose no risk of electric shock but there may be increasing risk of electric shock from strings of connected batteries exceeding three 12-volt units. Batteries are non-spillable - potential for exposure to contents only during recycling or if outer casing is cracked or damaged.

Storage:
Store batteries under roof in cool, dry, well-ventilated areas that are separated from incompatible materials and from activities which may create flames, sparks, or heat. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit.

Charging:
There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged

will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

VIII. EXPOSURE CONTROLS AND PERSONAL PROTECTION

	Occupational Exposure Limits (mg/m^3)					
Ingredient:	US OSHA	US ACGIH	US NIOSH	Quebec PEV	Ontario OEL	EU OEL
Inorganic Lead	0.05	0.05	0.05	0.05	0.05	0.15(a)
Electrolyte (sulfuric acid/water solution)	1	0.2	1	1	0.2	0.05(b)

NOTES:

(a) as inhalable aerosol;

(b) thoracic fraction

Engineering Controls (Ventilation):

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant. Handle batteries cautiously. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when charging or handling batteries.

Hygiene Practices:

Wash hands thoroughly before eating, drinking or smoking after handling batteries.

Respiratory Protection (NIOSH/MSHA approved):

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Skin Protection:

None required under normal conditions. If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing, and boots.

Eye Protection:

None required under normal conditions. If battery case is damaged, chemical goggles or face shield.

Other Protection:

In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

IX. PHYSICAL AND CHEMICAL PROPERTIES - ELECTROLYTE

Boiling Point@760 mm Hg	226 to 237° F		Specific Gravity @ 77°F (H_2O=1)	1.2185 to 1.3028
Melting Point	Not Applicable		Vapor Pressure (mm Hg)	13.5 to 17.8
% Solubility in Water	100		pH	Less than 1
Evaporation Rate (Butyl acetate=1)	Less Than 1		Vapor Density (AIR=1) Viscosity	Greater than 1 Not applicable
Appearance and Odor Threshold	Sulfuric Acid: Clear liquid with a sharp, penetrating, pungent odor. A battery is a manufactured article; no apparent odor.		% Volatiles by Volume @70°F	Not Applicable
Octanol Water Partition Coefficient (K_{ow})	Not Applicable			

Note: The properties above reflect 30-40% Sulfuric acid

X. STABILITY & REACTIVITY DATA

Stability: Stable __X__
Unstable ___

Conditions to Avoid: Prolonged overcharging and overheating current; sparks and other sources of ignition.

Incompatibilities: (materials to avoid)

Electrolyte: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas. No further concern for mechanical impact.

Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.

Hazardous Decomposition Products:

Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.

Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

Hazardous Polymerization: Will Not Occur

XI. TOXICOLOGICAL DATA

Routes of Entry:

Electrolyte: Harmful by all routes of entry.

Lead compounds: Hazardous exposure can occur only when product is heated above the melting point, oxidized or otherwise processed or damaged to create dust, vapor, or fume.

Acute Toxicity:

Inhalation LD_{50}: Electrolyte: LC_{50} rat: 375 mg/m^3; LC_{50}: guinea pig: 510 mg/m^3

Elemental Lead: Acute Toxicity Point Estimate = 4500 ppmV (based on lead bullion)

Oral LD_{50}: Electrolyte: rat: 2140 mg/kg

Elemental lead: Acute Toxicity Estimate (ATE) = 500 mg/kg body weight (based on lead bullion)

Inhalation:

Electrolyte: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.

Lead compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:

Electrolyte: May cause severe irritation of mouth, throat, esophagus, and stomach.

Lead compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea, and severe cramping. This may lead rapidly to systemic toxicity.

Skin Contact:

Electrolyte: Severe irritation, burns, and ulceration. Sulfuric acid is not readily absorbed through the skin and is not a dermal sensitizer.

Lead compounds: Not absorbed through the skin and not a dermal sensitizer.

Eye Contact:

Electrolyte: Severe irritation, burns, cornea damage, blindness.

Lead compounds: May cause eye irritation.

Synergistic Products:

Electrolyte: No known synergistic products

Lead compounds: Synergistic effects have been noted with heavy metals (arsenic, cadmium, mercury), N-nitroso-N-(hydroxyethyl)ethylamine, N-(4-fluoro-4-biphenyl)acetamide, 2-(nitrosoethylamine)ethanol, and benzo[a]pyrene.

Additional Information:

Medical Conditions Generally Aggravated by Exposure:

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of electrolyte (water and sulfuric acid solution) with skin may aggravate skin diseases such as eczema and contact dermatitis. Contact of electrolyte (water and sulfuric acid solution) with eyes may damage cornea and/or cause blindness. Lead and its compounds can aggravate some forms of kidney, liver, and neurologic diseases.

Additional Health Data:

All heavy metals, including the hazardous ingredients in this product, are taken into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by adequate precautions such as ventilation and respiratory protection covered in Section VIII. Follow good personal hygiene to avoid inhalation and ingestion: wash hands, face, neck and arms thoroughly before eating, smoking or leaving the work site. Keep contaminated clothing out of non-contaminated areas, or wear cover clothing when in such areas. Restrict the use and presence of food, tobacco and cosmetics to non-contaminated areas. Work clothes and work equipment used in contaminated areas must remain in designated areas and never taken home nor laundered with personal non-contaminated clothing. This product is intended for industrial use only and should be isolated from children and their environment.

XII. ECOLOGICAL INFORMATION

Environmental Fate: lead is very persistent in soil and sediments. No data on environmental degradation. Mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds and not elemental lead.

Environmental Toxicity: Aquatic Toxicity:

Sulfuric acid: 24-hr LC_{50}, freshwater fish (*Brachydanio rerio*): 82 mg/L
96 hr- LOEC, freshwater fish (*Cyprinus carpio*): 22 mg/L

Lead: 48 hr LC_{50} (modeled for aquatic invertebrates): <1 mg/L, based on lead bullion

XIII. DISPOSAL INFORMATION

US

Sulfuric Acid: Neutralize as described above for a spill, collect residue and place in a container labeled as containing hazardous waste. Dispose of as a hazardous waste. If uncertain about labeling procedures, call your local battery distributor or listed contact. DO NOT FLUSH LEAD CONTAMINATED ACID TO SEWER.

Spent batteries Send to secondary lead smelter for recycling. Follow applicable federal, state and local regulations Neutralize as in preceding step. Collect neutralized material in sealed container and handle as hazardous waste as applicable. A copy of this MSDS must be supplied to any scrap dealer or secondary lead smelter with the battery.

XIV. TRANSPORT INFORMATION

GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:
Batteries, Wet, Non-Spillable
UN 2800, 8, PG III
Label: "NON-SPILLABLE" or "NON-SPILLABLE BATTERY"
For US, refer to 49 CFR 173.159 for details.

AIRCRAFT – ICAO- IATA:
For air shipments, reference IATA Dangerous Goods Regulations Special Provision A67 and Packing Instruction 872.

VESSEL – IMO-IMDG:
For shipments by water, reference IMDG Special Provision 238 and Packing Instruction P003.

ADDITIONAL INFORMATION:

- Non-Spillable Battery complies with the provisions listed in 49 CFR 173.159. Does not require marking with an identification number or hazardous label and is not subject to hazardous shipping paper requirements.
- Each battery and the outer packaging must be plainly and durably marked "NON-SPILLABLE" or "NON-SPILLABLE BATTERY".
- Batteries must be kept upright at all times and packaged as required to prevent short circuits.
- Transport may require packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped.

XV. REGULATORY INFORMATION

United States:

EPA SARA Title III

Section 302 EPCRA Extremely Hazardous Substances (EHS):

Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of **1,000 lbs.**

EPCRA Section 302 notification is required if **500 lbs** or more of sulfuric acid is present at one site (40 CFR 370.10). An average automotive/commercial battery contains approximately 5 lbs of sulfuric acid. Contact your GNB representative for additional information.

Section 304 CERCLA Hazardous Substances:

Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning and Community Right to Know Act) is **1,000 lbs**. State and local reportable quantities for spilled sulfuric acid may vary.

Section 311/312 Hazard Categorization:

EPCRA Section 312 Tier Two reporting is required for non-automotive batteries if sulfuric acid is present in quantities of **500 lbs** or more and/or if lead is present in quantities of **10,000 lbs** or more.

Section 313 EPCRA Toxic Substances:

Supplier Notification: This product contains a toxic chemical or chemicals subject to the reporting requirements of section 313 of (Title) III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

Chemical	CAS	Percent by Weight
Lead (Pb)	7439-92-1	65-69
Electrolyte: Sulfuric Acid (H_2SO_4)	7664-93-9	17-30

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year. **Note:** The Section 313 supplier notification requirement does not apply to batteries that are "consumer products".

TSCA: Each ingredient chemical listed in Section III of this SDS is also listed on the TSCA Registry.

OSHA: Considered hazardous under Hazard Communication Act (29CFR1910.1200)

RCRA: Spent lead-acid batteries are not regulated as hazardous waste when recycled.

CAA: Exide Technologies supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFC's and other ozone depleting chemicals (ODC's), defined by the USEPA as Class I substances. Pursuant to Section 611 of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, Exide established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.

NFPA Hazard Rating for sulfuric acid:

Flammability (Red)	=	0
Health (Blue)	=	3
Reactivity (Yellow)	=	2

US State Notifications & Warnings	Identification	Notifications/Warning
California	California Proposition 65	"WARNING: This product contains lead, a chemical known to the State of California to cause cancer, or birth defects or other reproductive harm."
		Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer.
		The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects or to cause reproductive harm: 1. Strong inorganic acid mists including sulfuric acid; CAS #: NA; 17-30% wt 2. Lead – CAS No. 7439-92-1; 65-69% wt.
	Consumer Product Volatile Organic Compound Emissions	This product is not regulated as a consumer product for purposes of CARB/OTC VOC Regulations, as sold for the intended purpose and into the industrial/commercial supply chain.

Country/Organization	Identification	Notifications/Warning
Canada	All chemical substances in this product are listed on the CEPA DSL/NDSL or are exempt from list requirements.	This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Refer to the Controlled Products Regulation for product labeling requirements
	NPRI and Ontario Regulation 127/01	This product contains the following chemicals subject to the reporting requirements of Canada NPRI and/or Ont. Reg. 127/01: Chemical — CAS # — %wt Lead — 7439-92-1 — 65-69 Sulfuric acid — 7664-93-9 — 17-30
	Toxic Substances List	Lead
EU	European Inventory of Existing Commercial Chemical Substances (EINECS):	All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.

XVI. OTHER INFORMATION

DATE ISSUED: November 20, 2015

OTHER INFORMATION:	Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2). Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.
SOURCES OF INFORMATION:	International Agency for Research on Cancer (1987), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France. Ontario Ministry of Labor Regulation 654/86. Regulations

	Respecting Exposure to Chemical or Biological Agents.
PREPARED BY:	ENVIRONMENTAL, SAFETY AND HEALTH DEPARTMENT EXIDE TECHNOLOGIES 13000 DEERFIELD PKWY., BLDG. 200 MILTON, GA 30004

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. THIS INFORMATION SHOULD BE EFFECTIVELY COMMUNICATED TO EMPLOYEES AND OTHERS WHO MIGHT COME IN CONTACT WITH THE PRODUCT.

WHILE THE INFORMATION ACCUMULATED AND SET FORTH HEREIN IS BELIEVED TO BE ACCURATE AS OF THE DATE HEREOF, EXIDE TECHNOLOGIES MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE FOR THEIR PARTICULAR CIRCUMSTANCES.

ANY PHOTOCOPY MUST BE OF THIS ENTIRE DOCUMENT

SAFETY DATA SHEET

288 HTC Extreme Performance with DYNAVIS® ISO 22, 32 and 46
288 HTC Extreme Performance MEHF ISO 68 and 100

Section 1. Identification

GHS product identifier : 288 HTC Extreme Performance with DYNAVIS® ISO 22, 32 and 46
288 HTC Extreme Performance MEHF ISO 68 and 100

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Multi-grade anti-wear hydraulic fluid.

Supplier's details : Schaeffer Mfg. Company
102 Barton Street
Saint Louis, Missouri 63104
Tel: 314-865-4100
Fax: 314-865-4107
Toll Free: 1-800-325-9962
E-Mail: safety@schaefferoil.com
Web: http://www.schaefferoil.com

Emergency telephone number (with hours of operation) : +1 314 865-4105 (24-hour response number)

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

Ingredient name	%	CAS number
Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated	30 - 60	68037-01-4
Distillates (petroleum), hydrotreated light naphthenic	10 - 30	64742-53-6
Distillates (petroleum), hydrotreated light	1 - 5	64742-47-8
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	1 - 5	72623-86-0
White mineral oil (petroleum)	1 - 5	8042-47-5

United States: The exact percentage (concentration) in the composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.
Canada: The exact percentage (concentration) in the composition has been withheld as a trade secret in accordance with the amended HPR as of April 2018.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : U.S.A. regulations may require reporting spills of this material that could reach any surface waters. Report spills to all applicable Federal, State, Provincial and local authorities and/or the United States National Response Center at (800) 424-8802 as appropriate or required.

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

United States

Occupational exposure limits

Ingredient name	Exposure limits
Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated	None.
Distillates (petroleum), hydrotreated light naphthenic	**OSHA PEL (United States, 5/2018).** TWA: 5 mg/m³ 8 hours. **ACGIH TLV (United States, 3/2018).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction **NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³ 10 hours. Form: Mist STEL: 10 mg/m³ 15 minutes. Form: Mist
Distillates (petroleum), hydrotreated light	**ACGIH TLV (United States, 3/2018). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	**OSHA PEL (United States, 5/2018).** TWA: 5 mg/m³ 8 hours. **ACGIH TLV (United States, 3/2018).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction **NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³ 10 hours. Form: Mist STEL: 10 mg/m³ 15 minutes. Form: Mist
White mineral oil (petroleum)	**OSHA PEL (United States, 5/2018).** TWA: 5 mg/m³ 8 hours. **ACGIH TLV (United States, 3/2018).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction **NIOSH REL (United States, 10/2016).** TWA: 5 mg/m³ 10 hours. Form: Mist STEL: 10 mg/m³ 15 minutes. Form: Mist

4/11

Section 8. Exposure controls/personal protection

Canada

Occupational exposure limits

Ingredient name	Exposure limits
Distillates (petroleum), hydrotreated light naphthenic	**CA Alberta Provincial (Canada, 6/2018).** 8 hrs OEL: 5 mg/m³ 8 hours. Form: Mist 15 min OEL: 10 mg/m³ 15 minutes. Form: Mist **CA Quebec Provincial (Canada, 1/2014).** TWAEV: 5 mg/m³ 8 hours. Form: Mist STEV: 10 mg/m³ 15 minutes. Form: Mist
Distillates (petroleum), hydrotreated light	**CA British Columbia Provincial (Canada, 7/2018). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours. **CA Alberta Provincial (Canada, 6/2018). Absorbed through skin.** 8 hrs OEL: 200 mg/m³, (as total hydrocarbon vapor) 8 hours. **CA Ontario Provincial (Canada, 1/2018). Absorbed through skin.** TWA: 200 mg/m³, (as total hydrocarbon vapor) 8 hours.
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	**CA Alberta Provincial (Canada, 6/2018).** 8 hrs OEL: 5 mg/m³ 8 hours. Form: Mist 15 min OEL: 10 mg/m³ 15 minutes. Form: Mist **CA Quebec Provincial (Canada, 1/2014).** TWAEV: 5 mg/m³ 8 hours. Form: Mist STEV: 10 mg/m³ 15 minutes. Form: Mist
White mineral oil (petroleum)	**CA British Columbia Provincial (Canada, 7/2018).** TWA: 1 mg/m³ 8 hours. **CA Alberta Provincial (Canada, 6/2018).** 8 hrs OEL: 5 mg/m³ 8 hours. Form: Mist 15 min OEL: 10 mg/m³ 15 minutes. Form: Mist **CA Quebec Provincial (Canada, 1/2014).** TWAEV: 5 mg/m³ 8 hours. Form: Mist STEV: 10 mg/m³ 15 minutes. Form: Mist

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Wear eye protection such as safety glasses, chemical goggles, or face shields if engineering controls or work practices are not adequate to prevent eye contact.

Skin protection

Hand protection : Use nitrile or oil resistant gloves.

Body protection : Personal protective clothing such as gloves, aprons, boots and complete facial protection should be selected based on the task being performed and the risks involved. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.

Respiratory protection : If a risk assessment indicates that respiratory protection is required, use a properly fitted, air-purifying or supplied air respirator that complies with an approved standard. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state	:	Liquid. [Clear.]
Color	:	Blue.
Odor	:	Petroleum.
Odor threshold	:	Not available.
pH	:	Not applicable.
Melting point	:	Not available.
Boiling point/boiling range	:	>315°C (>599°F)
Flash point	:	Open cup: 199 to 227°C (390.2 to 440.6°F) [Cleveland.]
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Lower and upper explosive (flammable) limits	:	Not available.
Vapor pressure	:	Not available.
Vapor density	:	>1 [Air = 1]
Relative density	:	0.88
Solubility	:	Negligible in water.
Partition coefficient: n-octanol/water	:	Not available.
Auto-ignition temperature	:	Not available.
Decomposition temperature	:	Not available.
Viscosity	:	Kinematic (100°C): 5 to 15 cSt Kinematic (40°C): 20 to 110 cSt
Flow time (ISO 2431)	:	Not available.
VOC content	:	Not available.

Section 10. Stability and reactivity

Reactivity	:	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	:	This material is considered stable under normal ambient and anticipated storage and handling condtitions of temperature and pressure.
Possibility of hazardous reactions	:	May react with oxygen and strong oxidizing agents, such as chlorates, peroxides, etc.
Conditions to avoid	:	No specific data.
Incompatible materials	:	Reactive or incompatible with the following materials: Strong acids, bases and oxidizers.
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

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Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Distillates (petroleum), hydrotreated light naphthenic	LC50 Inhalation Dusts and mists	Rat	2180 mg/m³	4 hours
	LD50 Oral	Rat	>5000 mg/kg	-
White mineral oil (petroleum)	LD50 Oral	Rat	>5000 mg/kg	-

Irritation/Corrosion

There is no data available.

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

Name	Result
Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated	ASPIRATION HAZARD - Category 1
Distillates (petroleum), hydrotreated light naphthenic	ASPIRATION HAZARD - Category 1
Distillates (petroleum), hydrotreated middle	ASPIRATION HAZARD - Category 1
Distillates (petroleum), hydrotreated light	ASPIRATION HAZARD - Category 1
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	ASPIRATION HAZARD - Category 1
White mineral oil (petroleum)	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Distillates (petroleum), hydrotreated light	Acute LC50 2200 µg/L Fresh water	Fish - Lepomis macrochirus	4 days

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated	>6.5	-	high
White mineral oil (petroleum)	>6	-	high

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

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Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.

AERG : Not applicable

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.
Clean Water Act (CWA) 307: Naphthalene; Ethylbenzene; Toluene; Benzene
Clean Water Act (CWA) 311: Naphthalene; Ethylbenzene; Toluene; Benzene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

No products were found.

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Section 15. Regulatory information

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

Name	Classification
Dec-1-ene, homopolymer, hydrogenated Dec-1-ene, oligomers, hydrogenated	ASPIRATION HAZARD - Category 1
Distillates (petroleum), hydrotreated light naphthenic	ASPIRATION HAZARD - Category 1
Distillates (petroleum), hydrotreated light	FLAMMABLE LIQUIDS - Category 3 ASPIRATION HAZARD - Category 1
Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based	ASPIRATION HAZARD - Category 1
White mineral oil (petroleum)	ASPIRATION HAZARD - Category 1

SARA 313

There is no data available.

State regulations

Massachusetts : The following components are listed: White mineral oil (petroleum); Lubricating oils (petroleum), C15-30, hydrotreated neutral oil-based; Distillates (petroleum), hydrotreated heavy paraffinic; Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based; Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based, high-viscosity; Distillates (petroleum), hydrotreated light naphthenic

New York : None of the components are listed.

New Jersey : The following components are listed: Lubricating oils (petroleum), C20-50, hydrotreated neutral oil-based

Pennsylvania : None of the components are listed.

California Prop. 65

WARNING: This product can expose you to chemicals including Benzene, which is known to the State of California to cause cancer and birth defects or other reproductive harm. This product can expose you to chemicals including Ethylbenzene, Naphthalene and Ethyl acrylate, which are known to the State of California to cause cancer, and Toluene, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Canadian lists

Canada inventory (DSL NDSL) : All components are listed or exempted.

Canadian NPRI : The following components are listed: White mineral oil (petroleum); Distillates (petroleum), hydrotreated light

CEPA Toxic substances : None of the components are listed.

Section 16. Other information

Health : 0 / **Flammability :** 1 **Physical hazards :** 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Health : 0 **Flammability :** 1 **Instability :** 0

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Section 16. Other information

Procedure used to derive the classification

Classification	Justification
Not classified.	

US Tariff Heading Number : 2710.19.3020

Schedule B Code : 2710.19.3020

History

Date of issue mm/dd/yyyy : 07/30/2019

Date of previous issue : 06/15/2015

Version : 2

Prepared by : KMK Regulatory Services Inc.

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL DTE 10 EXCEL 22**
Product Description: Base Oil and Additives
Product Code: 201560103620, 622613-00, 97AY98
Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
22777 Springwoods Village Parkway
Spring, TX 77253 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information	800-662-4525
MSDS Internet Address	www.exxon.com, www.mobil.com

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS
No significant hazards.

HEALTH HAZARDS
High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS
No significant hazards.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary

from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
2,6-DI-TERT-BUTYLPHENOL	128-39-2	0.1 - < 1%	H315, H400(M factor 1), H410(M factor 1)
ALKYL DITHIOPHOSPHATE	255881-94-8	0.1 - < 1%	H319(2A), H400(M factor 1), H410(M factor 1)
DISTILLATES, HEAVY, C18-50 - BRANCHED, CYCLIC AND LINEAR	848301-69-9	80 - < 90%	H304
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	64742-55-8	5 - < 10%	H304

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurized mists may form a flammable mixture.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >175°C (347°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The type of container used to store the material may affect static accumulation and dissipation. Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	Mist.	TWA	5 mg/m3		N/A	OSHA Z1
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	Mist.	TWA	5 mg/m3		N/A	ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
Control measures to consider:
No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.84 [ASTM D4052]
Flammability (Solid, Gas): N/A
Flash Point [Method]: >175°C (347°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F) [Estimated]
Decomposition Temperature: N/D
Vapor Density (Air = 1): > 2 at 101 kPa [Estimated]
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C [Estimated]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5 [Estimated]
Solubility in Water: Negligible
Viscosity: 22.4 cSt (22.4 mm2/sec) at 40 °C | 5.1 cSt (5.1 mm2/sec) at 100°C [ASTM D 445]
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -48°C (-54°F) [ASTM D97]
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.

Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

Contains:
Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land.

Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY
Biodegradation:
Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL
Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

OTHER ECOLOGICAL INFORMATION
VOC: 3 G/L [ASTM E1868-10]

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS
Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION
RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is not considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: TSCA
Special Cases:

Inventory	Status
AICS	Restrictions Apply
ENCS	Restrictions Apply
IECSC	Restrictions Apply
KECI	Restrictions Apply
NDSL	Restrictions Apply

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
HYDROTREATED LIGHT PARAFFINIC DISTILLATES, PETROLEUM	64742-55-8	1, 4

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H319(2A): Causes serious eye irritation; Serious Eye Damage/Irr, Cat 2A
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Section 15: National Chemical Inventory Listing information was modified.
Section 15: Special Cases Table information was modified.

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Internal Use Only
MHC: 0B,0B,0,0,0,0 PPEC: A

DGN: 7086950XUS (1013880)

TROUBLESHOOTING GUIDE

Cylinders are not syncing/mast is not hitting both rest pads at the same time:

Sometimes when the XSERIES has not been used for some time, the hydraulic system needs to be synchronized. If you experience this, simply raise the mast 8-10 (2.5m-3m) feet, and then lower it down. When one part of the mast finds the rest, hold the button for 3 seconds, and then let off for 3 seconds. Repeat this until both sections of the mast are sitting on the rest pads. Raise the mast again 8-10 feet (2.5m-3m) , the synchronizing may need to be repeated to sync completely.

HYDRAULIC FLUID LEAKS:

- Around the fluid filter housing; tightening the filter by hand has stopped leaking in that area

- A plug underneath the machine connected to the counterweight hydraulic cylinder may have intermittent delayed leaking/seeping. This can be remedied by tightening the plug, or removing the plug and re-applying sealant and then re-installing. Malta Dynamics would like to be informed of any issues of this kind so we can track them, and/or furnish a new plug if necessary.

- Any other fluid leaking can affect performance and safety of the XSERIES machine, please remove your XSERIES machine from service if any fluid leak is present, and call Malta Dynamics.

OUTRIGGER PINS BROKEN OR DAMAGED:

- In X1240 and X1250 models manufactured before July 2018 have spring-loaded pins which lock the sliding outriggers into place. These can be bent, broken, or otherwise not usable.
    - oTesting in spring 2018 by a 3rd party testing laboratory confirmed that the XSERIES Mobile Grabber no longer needs to have outriggers extended to provide fall protection to workers. Our recommendation is to keep the outriggers locked into the closest setting to the frame of the machine, and use the outrigger jacks from that position. If the pins become unsafe or broken, replace them with the appropriate bolt so that the outriggers no longer can be pulled out.

HYDRAULIC SYSTEM FAILURE IN COLD CLIMATES:

•The XSERIES machine operates with an on-demand electric motor hydraulic system. We also have spring pressure check valves to ensure a fluid loss does not pull the mast of the machine down if a fluid loss occurs while in use.

The way in which the hydraulic system operates, the fluid operates at the low end of the temperature range, so in situations where your XSERIES Mobile Grabber is stored and used in or below freezing temperatures, there is a possibility that the fluid won't flow properly. This can lead to cylinders coming out of synchronization, or a machine that will not raise or lower.

o Malta Dynamics has identified alternate hydraulic fluids to use in extremely cold climates. Call with your climate details and we will advise of the best fluid for your needs.

MAST WILL NOT RAISE TO FULL HEIGHT

•If the mast or extension on your XSERIES Mobile Grabber does not extend all the way, giving the audible motor noise on full extension, then it is possible that more fluid needs to be added to your reservoir (located inside control box).

oUse a funnel and approved hydraulic fluid, and add ½ quart of fluid at a time until the machine operates properly.

•If the system is unusually noisy or gives a 'gurgling' sound, that is a sign to add hydraulic fluid. Add fluid using the steps above.

XSERIES GO! DOES NOT DRIVE STRAIGHT

•If your XSERIES Mobile Grabber is equipped with the Grabber GO! Option (M1000), and does not drive straight, or the friction drive spins without moving the tire, it may need adjusted.

oThe friction drive motor is mounted to the frame with slotted holes for adjustment. Loosen (but do not remove) the fasteners, adjust to the direction needed, and tighten fastener. This may require several adjustments to both sides to correct.

USE & SYNCHRONIZATION OF WIRELESS CONTROLLER:

OPERATION:

- To turn on the wireless controller, press and hold the POWER button for at least 2 seconds and release
- To turn the wireless controller off, press and hold the POWER button until LEDs turn off
- The wireless controller is designed with a power saving feature which turns the wireless controller off after 15 minutes if no buttons are pressed
- There are red and green LEDs both on the keypad of the wireless controller and inside the receiver case. The green LED will blink rapidly when the wireless controller and receiver are communicating. It will slowly if there is no communication (i.e. - no power to the receiver)
- The red LED on the receiver will blink if there is a shorted or open output. Refer to the ERROR CODE CHART tables and count the number of blinks to determine the output with the fault.
- The wireless controller's red LED blinks 1 time per second if the batteries are low and need to be replaced.

SYNCHRONIZING WIRELESS CONTROLLER AND RECEIVER:

Each wireless controller and receiver pair is synchronized together at the factory. If a new wireless controller is needed, synchronizing is required. Use the following procedure:

- Make sure both the wireless controller and receiver are off.
- Press and hold the POWER button on the wireless controller for more than 10 seconds. The red and green LED will start to blink.
- Apply power to the receiver
- Wait for a few seconds until only the green LED begins to blink on the wireless controller
- Sync complete

ZONE	REV	DESCRIPTION	DATE	BY

ENGINEER:	DETAILER:	DATE:	SCALE:	CADFILE:
ARNOLD	TURNER	7/2016	NONE	X1240-901

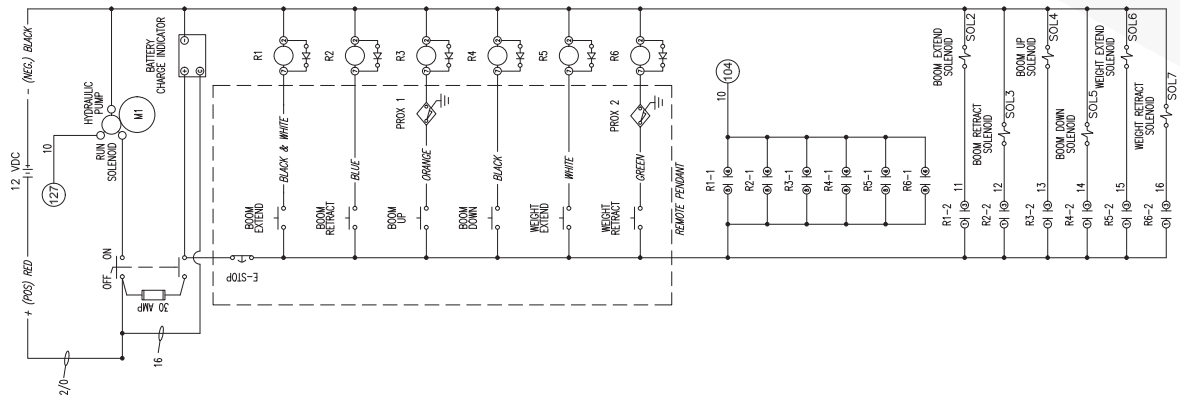
MACH. NO.: -
N.A.: -
SHEET No.: 1 OF 1

EZG Manufacturing
1939 North Riverview Rd
Malta, OH 43758
Ph: 740-962-2021
Fax: 740-962-2071
www.ezgmanufacturing.com

DRAWING TITLE: GRABBER X1240 WIRING DIAGRAM

DWG. No.: X1240

REV.: 0



ZONE	REV	DESCRIPTION	DATE	BY

MACH. NO.:	--	N.A.:	-	SHEET No.: 1 OF 1

ENGINEER:	DETAILER:	DATE:	SCALE:	CADFILE:
ARNOLD	TURNER	7/2016	NONE	X1250-901

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www.ezgmanufacturing.com

DRAWING TITLE:	DWG. No.:	REV.:
GRABBER X1250 WIRING DIAGRAM	X1250	0

MALTA DYNAMICS

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