

Parts & Service
Operators



TCV 5000
Turf Care Vehicle
Model 31-000-C
SN: DT310032

June 2014

Product Support:

**Hwy 55 & Poplar Ave; Cameron WI 54822
1-800-891-9435 productsupport@smithco.com**

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Thank you for purchasing a **Smithco** product.

Read this manual and all other manuals pertaining to the TCV 5000 carefully as they contain safety, operating, assembly and maintenance instructions. Failure to do so could result in personal injury or equipment damage. Keep manuals in a safe place after operator and maintenance personnel have read them. Right and left sides are from the operator's seat, facing forward.

| |
|---|
| <p>WARNING</p> <p>CALIFORNIA <i>Proposition 65 Warning</i> Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.</p> |
|---|

All **Smithco** machines have a Serial Number and Model Number. Both numbers are needed when ordering parts. Refer to engine manual for placement of engine serial number.

For product and accessory information, help finding a dealer, or to register your product please contact us at www.Smithco.com.

Information needed when ordering replacement parts:

1. Model Number of machine
2. Serial Number of machine
3. Name and Part Number of part
4. Quantity of parts

For easy access record your Serial and Model numbers here.

| | | | |
|--|--|--|-----------|
| SMITHCO | | | CE |
| <small>WAYNE, PENNSYLVANIA 19087 USA 610-688-4009 Fax 610-688-6069</small> | | | |
| SERIAL NO. | kW/hp | DATE OF MFG. | |
| <input style="width: 90%;" type="text"/> | <input style="width: 90%;" type="text"/> | <input style="width: 90%;" type="text"/> | |
| MODEL NO. | lb/kg Empty | lb/kg Full | |
| <input style="width: 90%;" type="text"/> | <input style="width: 90%;" type="text"/> | <input style="width: 90%;" type="text"/> | |

SAFE PRACTICES

1. It is your responsibility to read this manual and all publications associated with this machine.
2. Never allow anyone to operate or service the machine or its optional equipment without proper training and instructions. Never allow minors to operate any equipment.
3. Learn the proper use of the machine, the location and purpose of all the controls and gauges before you operate the equipment. Working with unfamiliar equipment can lead to accidents.
4. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears, hands and feet. Operate the machine only in daylight or in good artificial light.
5. Inspect the area where the equipment will be used. Pick up all debris you can find before operating. Beware of overhead obstructions and underground obstacles. Stay alert for hidden hazards.
6. Never operate equipment that is not in perfect working order or without decals, guards, shields, or other protective devices in place.
7. Never disconnect or bypass any switch.
8. Carbon monoxide in the exhaust fumes can be fatal when inhaled, never operate a machine without proper ventilation.
9. Fuel is highly flammable, handle with care.
10. Keep engine clean. Allow the engine to cool before storing and always remove the ignition key.
11. Disengage all drives and set park brake before starting the engine.
12. Never use your hands to search for oil leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury.
13. This machine demands your attention. To prevent loss of control or tipping of the vehicle:
 - A. Use extra caution in backing up the vehicle. Ensure area is clear.
 - B. Do not stop or start suddenly on any slope.
 - C. Reduce speed on slopes and in sharp turns. Use caution when changing directions on slopes.
 - D. Stay alert for holes in the terrain and other hidden hazards.
14. Before leaving operator's position:
 - A. Disengage all drives.
 - B. Set park brake.
 - C. Shut engine off and remove the ignition key.
 - D. If engine has to run to perform any maintenance keep hands, feet, clothing and all other parts of body away from moving parts.
15. Keep hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
16. Keep the area of operation clear of all bystanders.
17. Stop engine before making repairs/adjustments or checking/adding oil to the crankcase.
18. Use parts and materials supplied by **Smithco** only. Do not modify any function or part.

These machines are intended for professional maintenance on golf courses, sports turf, and any other area maintained turf and related trails, paths and lots. No guaranty as to the suitability for any task is expressed or implied.

WEIGHTS AND DIMENSIONS

| | |
|----------------|--------------------|
| Length | 128" (325 cm) |
| Width | 72" (183 cm) |
| Height w/ ROPS | 84" (213 cm) |
| Wheel Base | 68" (173 cm) |
| Weight Empty | 2355 lbs (1068 kg) |
| Weight Full | 7355lbs (3336 kg) |

SOUND LEVEL (DBA)

| | |
|--------------|----------|
| At ear level | 88.4 dBA |
|--------------|----------|

ENGINE

| | |
|--------------------|---|
| Make | Kubota |
| Model# | V1505 |
| Code / Spec# | 1G994-0000 |
| Horsepower | 35.5 hp (26.6 kW) |
| Fuel (EMISSIONS) | No.1-D or No. 2-D, S500: Low Sulfur Diesel (LSD) less than 500 ppm or 0.05 wt. % No1-D or No.2-D, S15: Ultra Low Sulfur Diesel (ULSD) less than 15 ppm or 0.0015 wt. % |
| Cooling System | Liquid Cooled |
| Lubrication System | Full Pressure |
| Alternator | 40 Amp |

WHEELS & TIRE

| | |
|--------|--|
| Front: | Two 20 x 11.00 x 10 Turf; 20 psi (1.4 bar) |
| Rear: | Two 29 x 14.00 x 15 Multi-Trac; 30 psi (2.0 bar) |

SPEED

| | |
|---------------------|------------------------|
| Infinitely Variable | 0-10 m.p.h. (0-18 kph) |
|---------------------|------------------------|

BATTERY

| | |
|--------------------------|-------------------------------|
| | Automotive type 24F - 12 volt |
| BCI Group | Size 24 |
| Cold Cranking Amps | 900 minimum |
| Ground Terminal Polarity | Negative (-) |
| Maximum Length | 10.25" (26 cm) |
| Maximum Width | 6.88" (17 cm) |
| Maximum Height | 10" (25 cm) |

FLUID CAPACITY

| | |
|--------------------------|---|
| Crankcase Oil | See Engine Manual |
| Fuel | 7 gallon (26.5 liters) |
| Hydraulic Fluid | 10 gallon (37.8 liters) |
| Grade of Hydraulic Fluid | SAE 10W-40 API Service SJ or higher Motor Oil |

SET UP

The Dump Truck arrives from **Smithco** setup and ready for service. Depending on freight conditions battery may need to be installed.

1. Check the tire pressure. The front tires are 20 psi (1.4 bar) and rear tires are 30 psi (2.0 bar).
2. Battery is located on right side of machine in front of rear tire. This is a negative grounding system.

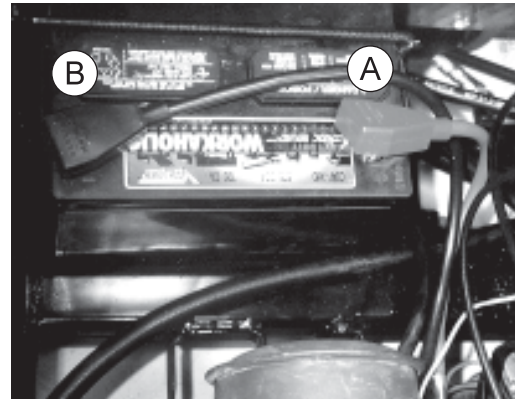


Connecting battery cables to the wrong post could result in personal injury and/or damage to the electrical system. Make sure battery and cables do not interfere or rub on any moving part. Connect red positive (+) cable (A) to battery first. When disconnecting remove black negative (-) cable (B) first.

3. Check hydraulic fluid level in tank located under the seat. Remove cap and add SAE 10W-40 API Service SJ or higher motor oil if necessary. Fluid level should be about 2-2 $\frac{1}{2}$ " (5-6.4 cm) from the top of the tank when cold. DO NOT OVERFILL.
4. Fill fuel tank, located on right side, with No. 2 diesel



Fuel is flammable, caution must be used when storing or handling it. Do not fill fuel tank while engine is running or an enclosed area, fumes are explosive and dangerous to inhale. DO NOT SMOKE while filling the fuel tank. DO NOT OVERFILL



5. Machine should be greased before starting, refer to *Maintenance* for grease fitting location.
6. Read operating instructions before starting.

FUEL

CHECK EMISSION REGULATIONS OF YOUR AREA

With Emission control now in effect diesel fuel specification type and sulfur content % (ppm) used must be in compliant with all applicable emission regulations for the area in which the engine is operated.

Use of diesel fuel with sulfur content less than 0.10% (1000 ppm) is strongly recommended.

If high sulfur fuel is used, change oil and oil filters twice as often.

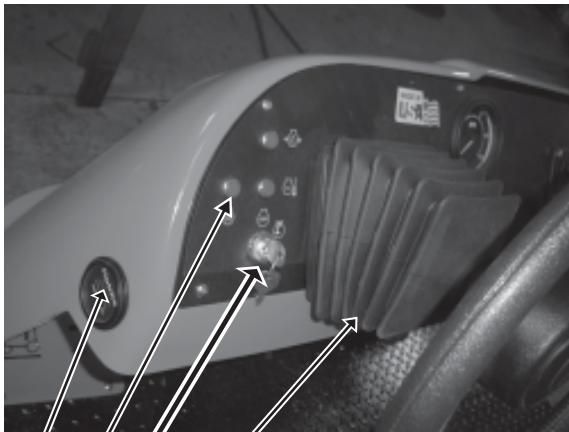
DO NOT USE Fuels that have sulfur content greater than 1.0% (10000 ppm).

Diesel fuels specified in EN 590 or ASTM D975 are recommended.

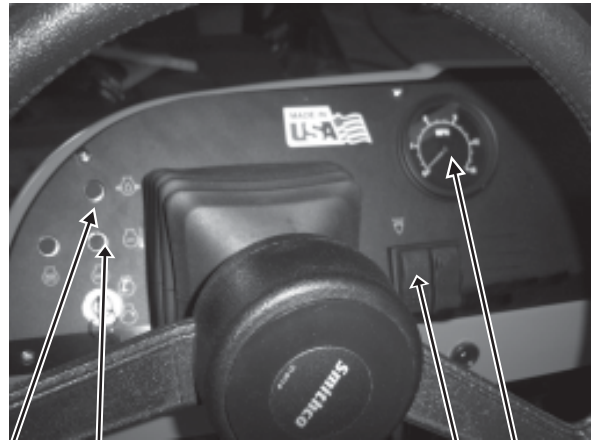
Since KUBOTA diesel engines of less than 56kW (75 hp) utilize EPA Tire 4 and Interim Tier 4 Standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory for these engines, when operated in US EPA regulated areas. Therefore, use No.2-D S500 or S15 diesel fuel as a alternative toe No. 2-D for ambient temperatures below -10°C (14° F).

TOWING

When it is necessary to move the dump truck without the engine running, there are 2 things that need to be done. First, the bypass valve built into hydrostatic pump must be "open" by turning it $\frac{1}{4}$ turn to open. The valve is located on the back side of the pump. An "open" valve allows fluid to pass through the wheels freely. When normal driven operation is desired, valve should be "closed" by turning it clockwise. Failure to "close" the valve with engine running means no power to wheels. Secondly, the hand brake needs to be manually released. The hand brake is located under the engine. To manually release the brake you must loosen the locknut and screw in the stem to the bottom. Tighten the lock nut and pump handle until hard.



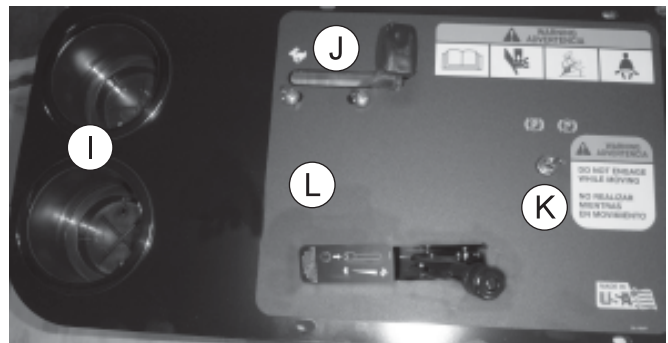
A B C D



E F G H

- A. Hour Meter - The hour meter indicates hours of machine operation. It operates only when the ignition switch is on.
- B. Glow Plug - When ignition is turned on, glow plug lights when ready to start.
- C. Ignition Switch - The ignition switch has three positions: Off - Run - Start.
- D. Tilt Steering - Hold lever down and adjust steering wheel to desired position and release lever.
- E. Oil Light - The oil light should come on when the ignition is on without the engine running and go out when the engine is running. The oil light will light when the oil pressure is low. If oil light should come on, shut engine off immediately and find the cause.
- F. Water Temperature Light - Temperature light will come on and a buzzer will sound when the engine starts to overheat.
- G. Lights - This rocker switch turns lights on by pushing on the top and off by pushing on the bottom.
- H. Speedometer - The Speedometer indicates ground speed of the vehicle in miles per hour and kilometers per hour.

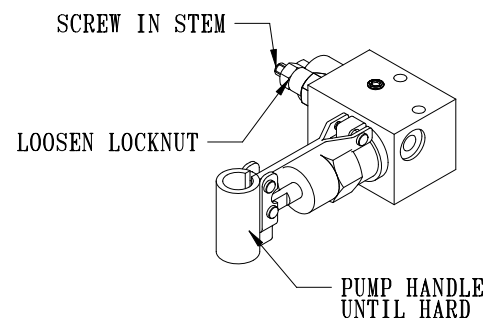
- I. Cup Holder - Holds 2 x-large cups.
- J. Hand Throttle - The hand throttle is used to regulate engine speed.
- K. Park Brake Toggle Switch - This toggle switch will engage park brake. Lift toggle cover and move switch forward. **DO NOT ENGAGE WHILE IN MOTION.**
- L. Dump Box Lever - Lifts and lowers dump box.



MANUAL BRAKE HAND PUMP MANIFOLD

The hand brake is located under the engine. The hand brake is connected to the seat switch and automatically engages when operator gets up from the seat. So when machine is not being driven, the machine is locked down. If engine is not running or you are towing the machine you will have to manually release the brake. **To manually release the brake** you must loosen the locknut and screw in the stem to the bottom. Tighten the lock nut and pump handle until hard.

Run machine at half-throttle minimum, prior to operating traction pedal. This will ensure proper brake release.



OPERATION

Before operating the Smithco Dump Truck, become familiar with all controls and functions. Also complete all maintenance requirements and read all safety warnings. Knowing the Dump Truck thoroughly, how it operates, and by doing the prescribed maintenance steps, you can expect trouble free operation for years to come.

SAFETY

Operator needs to always be the concern of an operator of a moving vehicle or any machine with moving parts.

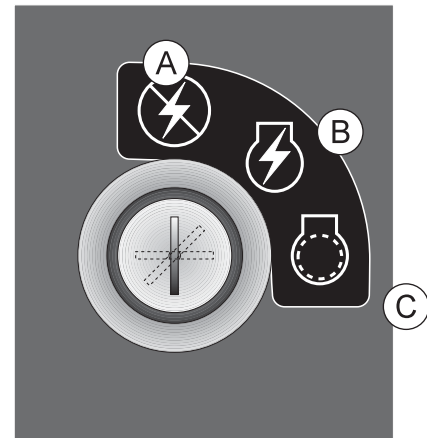
1. Keep all shields and guards in place.
2. Keep the parking brake engaged any time the operator is away from the vehicle or whenever service is performed.
3. Always wear the necessary protective clothing and equipment.
4. Turn engine off when refueling or performing maintenance not specifically requiring engine power.

DAILY CHECKLIST

1. Check the engine oil level. Add as needed. **DO NOT OVERFILL**. Refer to engine owner's manual for oil grade and procedure.
2. Tire pressure should be 20 psi (1.4 bar) on front and 30 psi (2.0 bar) on back.
3. Inspect the electrical system and battery cables for loose connections or frayed wiring. Replace any faulty equipment or tighten if loose.
4. Check hardware for loose or missing nuts, bolts, screws, etc., and tighten or replace as needed.
5. Inspect hydraulic lines for damage or leaks. Never use hands to inspect for leaks.
6. Check the hydraulic fluid level. The hydraulic fluid tank is located under the seat. The fluid level should be 2"-2½" (5 - 6.4 cm) from the top of the tank when cold. Use only SAE 10W-40 API Service SJ or higher Motor Oil.
7. Inspect the steering, throttle and shift linkages for good hookups and clear travel.
8. Check controls for smooth, proper working operation. Lubricate as needed.
9. Check anti-vibration mounts on engine frame.

STARTING THE ENGINE

1. The ignition switch is located on the dashboard. Insert the key (A) and turn clockwise to (B). When glow plug light goes off Turn key to (C) until the engine starts. Release the key and it will return to the run position (B).
2. Allow engine to idle and warm up before selecting direction of travel.



STOPPING THE ENGINE

NOTE: If the engine has been running under high power, let it run at slow idle speed a few minutes to cool the engine down, before turning the ignition switch to the OFF position.

1. Move the throttle lever to "slow" and turn ignition key to the "off" position.
2. Remove the ignition key and engage the park brake.



Never leave the vehicle unattended with the engine running. Always bring the vehicle to a complete stop, engage park brake, turn key off and remove key.

NOTE: Run machine at half-throttle minimum, prior to operating traction pedal. This will ensure proper brake release.

HILLSIDE OPERATION

Do NOT stop or start suddenly on any slope. Be especially cautious when changing direction. Do NOT operate on slopes greater than 10°.

DUMPING

When dumping, the receiver hitch can interfere with box. Remove receiver hitch before dumping. Failure to do so will cause damage to the tailgate or box.

BATTERY

Batteries normally produce explosive gases which can cause personal injury. Do not allow flames, sparks or any ignited object to come near the battery. When charging or working near battery, always shield your eyes and always provide proper ventilation.

Battery cable should be disconnected before using "Fast Charge".

Charge battery at 15 amps for 10 minutes or 7 amps for 30 minutes. Do not exceed the recommended charging rate. If electrolyte starts boiling over, decrease charging.

Always remove grounded (-) battery clamp first and replace it last. Avoid hazards by:

1. Filling batteries in well-ventilated areas.
2. Wear eye protection and rubber gloves.
3. Avoid breathing fumes when electrolyte is added.
4. Avoid spilling or dripping electrolyte.



Battery Electrolyte is an acidic solution and should be handled with care. If electrolyte is splashed on any part of your body, flush all contact areas immediately with liberal amounts of water. Get medical attention immediately.

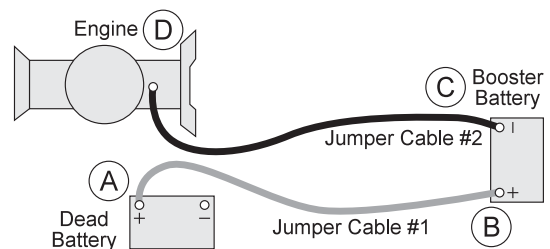
JUMP STARTING



Use of booster battery and jumper cables. Particular care should be used when connecting a booster battery. Use proper polarity in order to prevent sparks.

To jump start (negative grounded battery):

1. Shield eyes.
2. Connect ends of one cable to positive (+) terminals of each battery, first (A) then (B).
3. Connect one end of other cable to negative (-) terminal of "good" battery (C).
4. Connect other end of cable (D) to engine block on unit being started (NOT to negative (-) terminal of battery)



To prevent damage to other electrical components on unit being started, make certain that engine is at idle speed before disconnecting jumper cables.

MAINTENANCE



Before servicing or making adjustments to machine, stop engine and remove key from ignition.

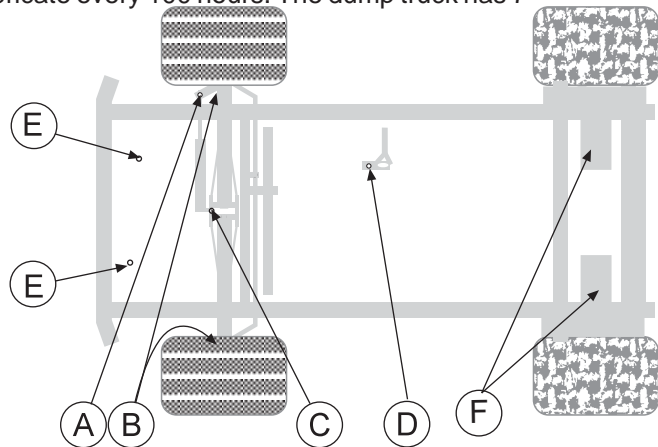
NOTE:

Use all procedures and parts prescribed by the manufacturer's. Read the engine manual before operation.

LUBRICATION

Use No. 2 General purpose lithium base grease and lubricate every 100 hours. The dump truck has 7 grease fittings.

- A. One on the rod end of hydraulic cylinder.
- B. One on each the right and left spindles.
- C. One on the center front pivot.
- D. One on the idler arm.
- E. One on each of the pedal relays.



ELECTRICAL CONNECTIONS

Use dielectric grease on all electrical connections.

AIR CLEANER ON ENGINE

Since the air cleaner on this engine is a dry type, never apply oil to it.

1. Open evacuator valve (see engine manual) once a week to remove large particles of dust and dirt.
2. Wipe the inside of the air cleaner with a cloth if it gets wet or dirty.
3. Avoid touching the element except when cleaning.
4. When dust adheres to the element, gently tap element on flat surface.
5. When carbon or oil adheres to the element clean according to engine manual.
6. Replace the element every year or every 6 months.
7. IMPORTANT - Make sure wing bolt for the element is tight enough. If it is loose, dust and dirt may be sucked in, wearing down the cylinder liner and piston ring, resulting in poor power output.

NOTE:

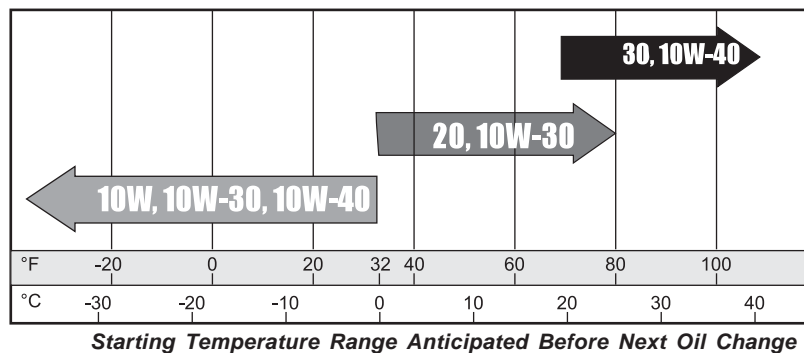
Do not use petroleum solvents, e.g., kerosene, which will cause cartridge to deteriorate. Do not use pressurized air to clean cartridge. Pressurized air can damage cartridge.

ENGINE OIL

With strict emission control regulations now in effect, the CF-4 and CG-4 engine oils have been developed for use with low sulfur fuels, for On-Highway vehicle engines. When Non-Road engines run on high sulfur fuel, it is advisable to use a "CF or better" classification engine oil with Total Base Number (a minimum TBN of 10 is recommended).

| O= Recommended | | X= Not Recommended | |
|-----------------------|---|--------------------|---|
| Lubricating Oil Class | | Fuel | |
| CF-4 | O | X | X |
| CG-4 | O | X | X |

Check the engine oil before starting or more than 5 minutes after stopping the engine. If oil level is low, remove oil filler plug and add new oil to the prescribed level. Do not overfill. Engine oil should be MIL-L2104C or have properties of API Classifications CD grades or higher. Change the type of Engine oil according to the ambient temperature.



HYDRAULIC OIL

1. Use SAE 10W-40 API Service SJ or higher motor oil.
2. For proper warranty, change oil every 500 hours or annually, whichever is first.
3. Oil level should be 2-2½" (5-6.4cm) from top of the tank when fluid is cold. Do not overfill.
4. After changing oil, run the machine for a few minutes. Check oil level and for leaks.
5. Always use extreme caution when filling hydraulic oil tank or checking level to keep system free of contaminants. Check and service more frequently when operating in extremely cold, hot or dusty conditions.
6. If the natural color of the fluid has become black or smells burnt, it is possible that an overheating problem exists.
7. If fluid becomes milky, water contamination may be a problem.
8. If either of the above conditions happen, change oil immediately after fluid is cool and find the cause. Take fluid level readings when the system is cold.
9. In extreme temperatures you can use straight weight oil. We recommend SAE 30W API Service SG when hot (above 90°F (33°C)) and SAE 10W API Service SJ or higher when cold (below 32°F (0°C) ambient temperature. Use either motor oil or hydraulic oil, but do not mix.
10. Oil being added to the system must be the same as what is already in the tank. Mark the tank fill area as to which type you put in.

TIRE PRESSURE

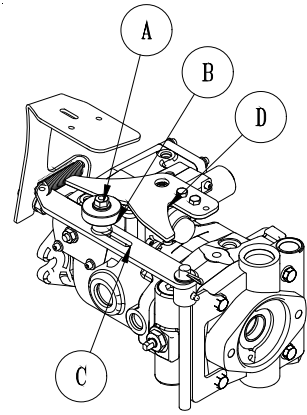
Caution must be used when inflating a low tire to recommended pressure. Over inflating can cause tires to explode. Front tires should be 20 psi (1.4bar) and rear tires should be 30 psi (2.0bar). Improper inflation will reduce tire life considerably.

WHEEL CREEP

WHEEL CREEP

"Creep" is when the engine is running and hydrostatic transmission is in neutral, but due to inadequate alignment, wheels still move. Do the following procedure to stop this motion.

1. Lift up and support machine so rear wheels are off the ground and can turn freely.
2. In the engine compartment, the hydrostatic pump is on the right side. The shift arm (D) is on top of the pump. The idler arm (B) has a bearing that rides in the vee of the shift arm. Loosen bolt (A).
3. With engine running, move bearing (B) so it centers on the shift arm (D) and 'wheel creep' stops.
4. Tighten all fasteners and test by using foot pedal linkage to see that 'creep' is removed.
5. Turn engine off and lower machine.



ADJUSTMENTS

SAFETY INTERLOCK SWITCH

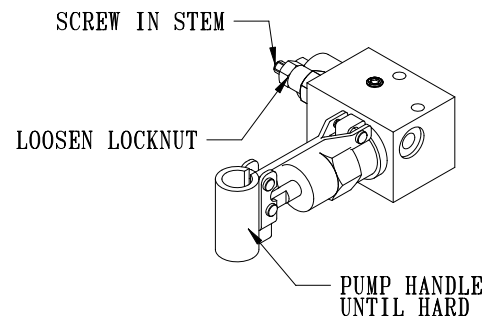
To adjust the interlock switch on the back hydrostatic pump loosen the set screw on the front half of the switch, with the ignition switch OFF. With a continuity tester connected across the switch, it should light with the shift arm centered. Move the shift arm to the right or left and the light should go off. By turning the back half of the switch clockwise it will reduce the amount of travel on the shift arm that is required for the light to remain on. The light must be on ONLY with the shift arm centered.

TOWING

When it is necessary to move the dump truck without the engine running, there are 2 things that need to be done. First, the bypass valve built into hydrostatic pump must be "open" by turning it $\frac{1}{4}$ turn to open. The valve is located on the back side of the pump. An "open" valve allows fluid to pass through the wheels freely. When normal driven operation is desired, valve should be "closed" by turning it clockwise. Failure to "close" the valve with engine running means no power to wheels. Secondly, the hand brake needs to be manually released. The hand brake is located under the engine. To manually release the brake you must loosen the locknut and screw in the stem to the bottom. Tighten the lock nut and pump handle until hard.

MANUAL BRAKE HAND PUMP MANIFOLD

The hand brake is located under the engine. The hand brake is connected to the seat switch and automatically engages when operator gets up from the seat. So when machine is not being driven, the machine is locked down. If engine is not running or you are towing the machine you will have to manually release the brake. **To manually release the brake** you must loosen the locknut and screw in the stem to the bottom. Tighten the lock nut and pump handle until hard.



Run machine at half-throttle minimum, prior to operating traction pedal. This will ensure proper brake release.

DUMPING

When dumping, the receiver hitch can interfere with box. Remove receiver hitch before dumping. Failure to do so will cause damage to the tailgate or box.

TWO MONTHS

1. Clean the exterior surfaces of the engine.
2. Change the oil and filter while the engine is still warm from operation.
3. Drain coolant from the radiator. Open cock at the bottom of the radiator, and remove the pressure cap to drain water completely. Leave the cock open. Hang a not written "No Water" on the pressure cap. Since water freezes when temperature drops below 0°C (32° F) it is important that no water is left in the machine.
4. Remove battery from the engine, adjust the electrolyte level, and recharge it. Store battery in a dry dark place.
5. Store machine in a clean, dry place.

EXTENDED STORAGE

1. Check for any damaged parts or missing decals. Replace as needed.
2. Drain crankcase completely and refill with recommended engine oil or equivalent.
3. Lubricate all grease points.
4. Check coolant protection and level.
5. Clean exterior surface of engine.
6. Seal all openings in engine and accessories with non-hygroscopic material. Mask off all areas to be used for electrical contact.
7. Tape all openings and make sure all surfaces are dry. Then spray all taped openings, all engine accessories including ignition wiring, and all exterior surfaces of engine with Insulation Compound.
8. Disconnect, remove and clean battery. Check electrolyte level. Charge the battery and store in a cool dry place (NOT directly on cement).
9. Put blocks or stands under the machine to take weight off tires.

AFTER STORAGE

1. Check for any damaged parts or missing decals. Replace as needed.
2. Lubricate all grease points.
3. Clean exterior surface of engine.
4. Remove all tape and obstructions from exterior engine surfaces.
5. Charge and replace battery.
6. Check tire pressure.
7. Remove blocks or supports from under the machine.
8. Check engine oil level and coolant level and lubricate all grease points.
9. Fill fuel tank.
10. Check belt tension.
11. Run engine approximately 5 minutes before putting the engine under load.

SERVICE CHART



Before servicing or making adjustments to the machine, stop engine, block wheels and remove key from ignition.



Follow all procedures and **ONLY** use parts prescribed by the manufacturer. Read the engine manual before maintenance.

The suggested maintenance checklist is not offered as a replacement for the manufacturer's engine manual but as a supplement. You must adhere to the guidelines established by the manufacturer for warranty coverage. In adverse conditions such as dirt, mud or extreme temperatures, maintenance should be more frequent.

Duplicate this page for routine use

| Maintenance Check Item | For the week of: | | | | | | |
|---|------------------|-------|------|--------|------|------|------|
| | Mon | Tues. | Wed. | Thurs. | Fri. | Sat. | Sun. |
| Check the Safety Seat Switch | | | | | | | |
| Check Steering Operation | | | | | | | |
| Check the fuel level | | | | | | | |
| Check the engine oil level. | | | | | | | |
| Check the condition of the air filter | | | | | | | |
| Clean the engine cooling fins. | | | | | | | |
| Check for unusual engine noises | | | | | | | |
| Check the hydraulic oil level | | | | | | | |
| Check hydraulic hoses and fittings for damage | | | | | | | |
| Check for fluid leaks. | | | | | | | |
| Check the tire pressure (20-30 psi) | | | | | | | |
| Check the Instrumentation | | | | | | | |
| Inspect electrical system for frayed wires | | | | | | | |
| Check neutral start | | | | | | | |
| Change oil filter. | | | | | | | |
| Change oil. | | | | | | | |
| Lubricate Machine and Booms | | | | | | | |
| Ensure all warning decals are intact. | | | | | | | |

| Areas of Concern | | |
|--------------------------|------|-------------|
| Inspection Performed by: | | |
| Item | Date | Information |
| | | |
| | | |
| | | |
| | | |
| | | |
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| | | |

| Item | Maintenance Procedure |
|-----------------------------------|---|
| After the first 8 operating hours | Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) Change the engine oil filter. |
| Before each use daily | Check the engine oil level. Clean area around muffler and controls. Check the hydraulic fluid level. Check the tire pressure. Check condition of hydraulic hoses and fittings. Check for oil or water leaks. Proper function of glow lamp timer. |
| After the first 50 hours | Change Hydraulic Oil Filter. Change Engine oil and filter. |
| Every 100 hours | Clean or change air filter. ^{1&2} Clean fuel filter element. ¹ Lubricate machine. Check the battery fluid level and cable connections.. Check fan belt tension and damage. |
| Every 200 hours | Check radiator hoses and clamp bands. Change engine oil. ¹ Check idle speed. Replace oil filter cartridge. ¹ Change hydraulic oil filter. ¹ Check air intake line. ¹ Torque the wheel lug nuts. (64-74 ft/lb (87-100 Nm)) |
| Every 500 hours or yearly | Clean Water Jacket and radiator interior. Replace fan belt. |
| Every 800 hours | Check valve clearance. |
| Every 1500 hours | Check injection nozzle pressure. |
| Every 3000 hours | Check turbo charger. Check injection pump. Check injection timing. |
| Every 2 years | Change radiator coolant (L.L.C.) Replace radiator hoses and clamp bands. Replace fuel hoses and clamps. Replace intake air lines. |

¹ In dusty conditions or when airborne debris is present, clean more often.

² Replace after every 6 times of cleaning

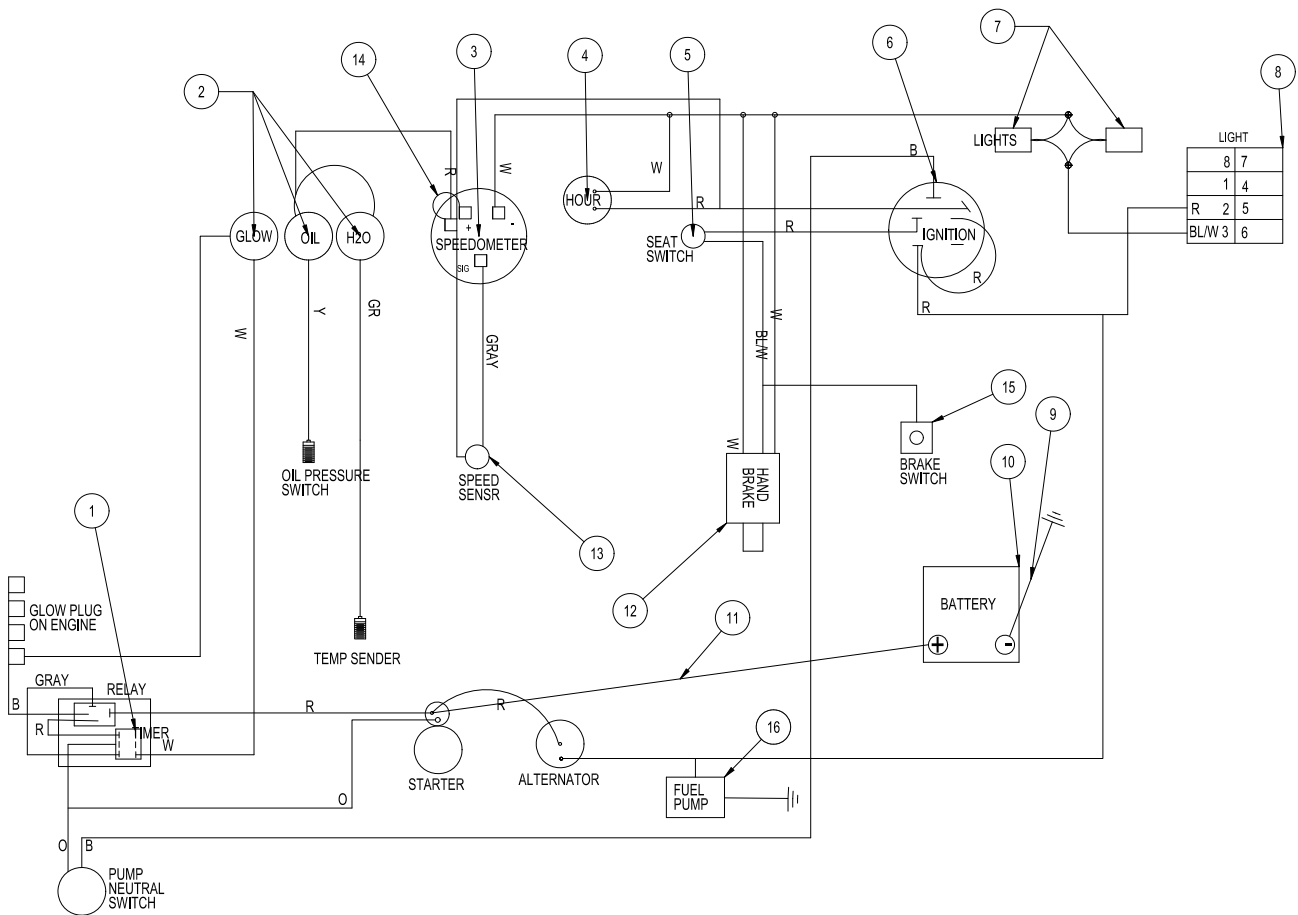
WIRING DIAGRAM

Use dielectric grease on all electrical connections.

Color Code Chart

| | |
|----|--------|
| Bl | Blue |
| Br | Brown |
| Y | Yellow |
| G | Green |
| O | Orange |
| R | Red |
| B | Black |
| P | Purple |
| W | White |

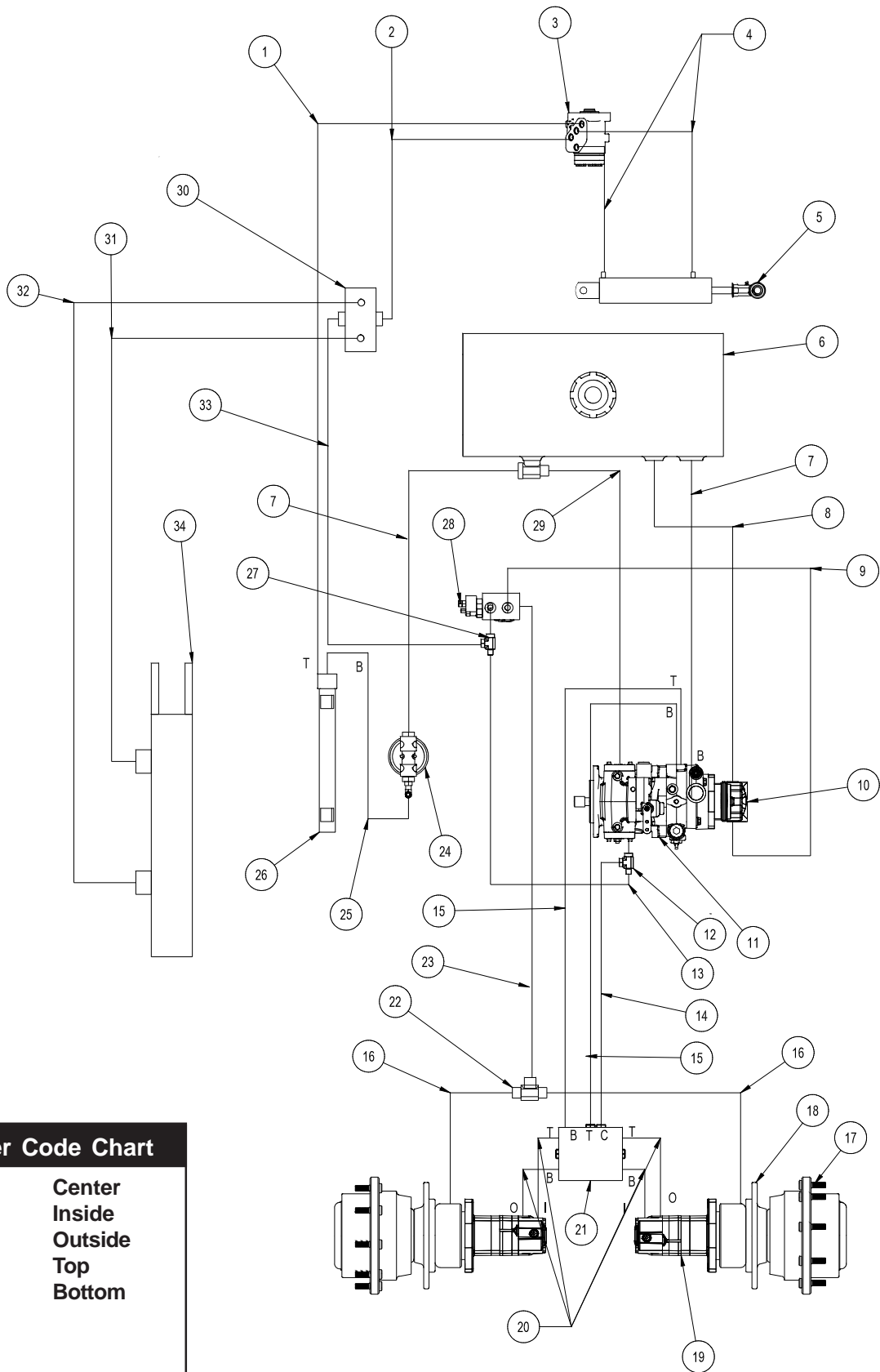
Diagrams



WIRING DIAGRAM

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|--------------------------|----------|
| 1 | 77-223 | Timer | 1 |
| | 30-042-06 | Relay | 1 |
| 2 | 50-359 | Warning Light | 3 |
| 3 | 10-556 | Speedometer | 1 |
| | 31-071 | Speedometer Wire | 1 |
| 4 | 12-017 | Hour Meter | 1 |
| 5 | 14-292 | Seat Switch | 1 |
| 6 | 13-488 | Ignition Switch | 1 |
| 7 | 32-014 | Lights | 2 |
| 8 | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-782 | Rocker Switch, Unlit | 1 |
| 9 | 48-147 | Ground Battery Cable | 1 |
| 10 | 33-216 | Battery | 1 |
| 11 | 76-326 | Positive Battery Cable | 1 |
| 12 | 30-104 | Manual Hand Brake | 1 |
| 13 | 16-883 | Speed Sensor | 1 |
| 14 | 31-071 | Red Power Wire | 1 |
| 15 | 12-003 | Park Brake Toggle Switch | 1 |
| | 30-143 | Toggle Switch Guard | 1 |
| 16 | 30-130 | Fuel Pump | 1 |
| NA | 30-148 | Main Wire Harness | 1 |
| NA | 30-149 | Engine Wire Harness | 1 |
| | 77-261 | 40 AMP Circuit Breaker | 1 |
| | 8977 | Circuit Breaker Boot | 1 |

HYDRAULIC DIAGRAM

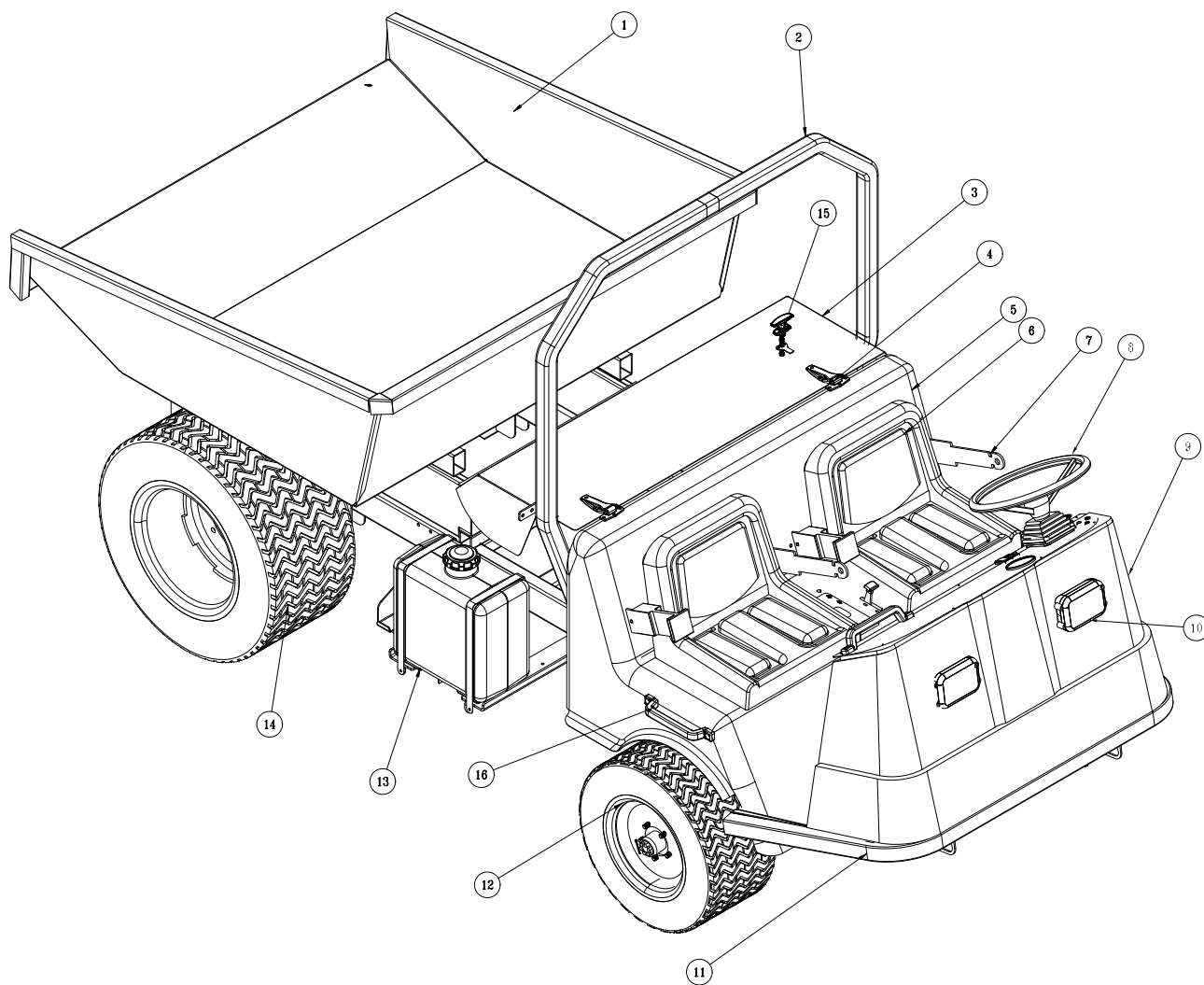


Letter Code Chart

| | |
|---|---------|
| C | Center |
| I | Inside |
| O | Outside |
| T | Top |
| B | Bottom |

HYDRAULIC DIAGRAM PARTSLIST

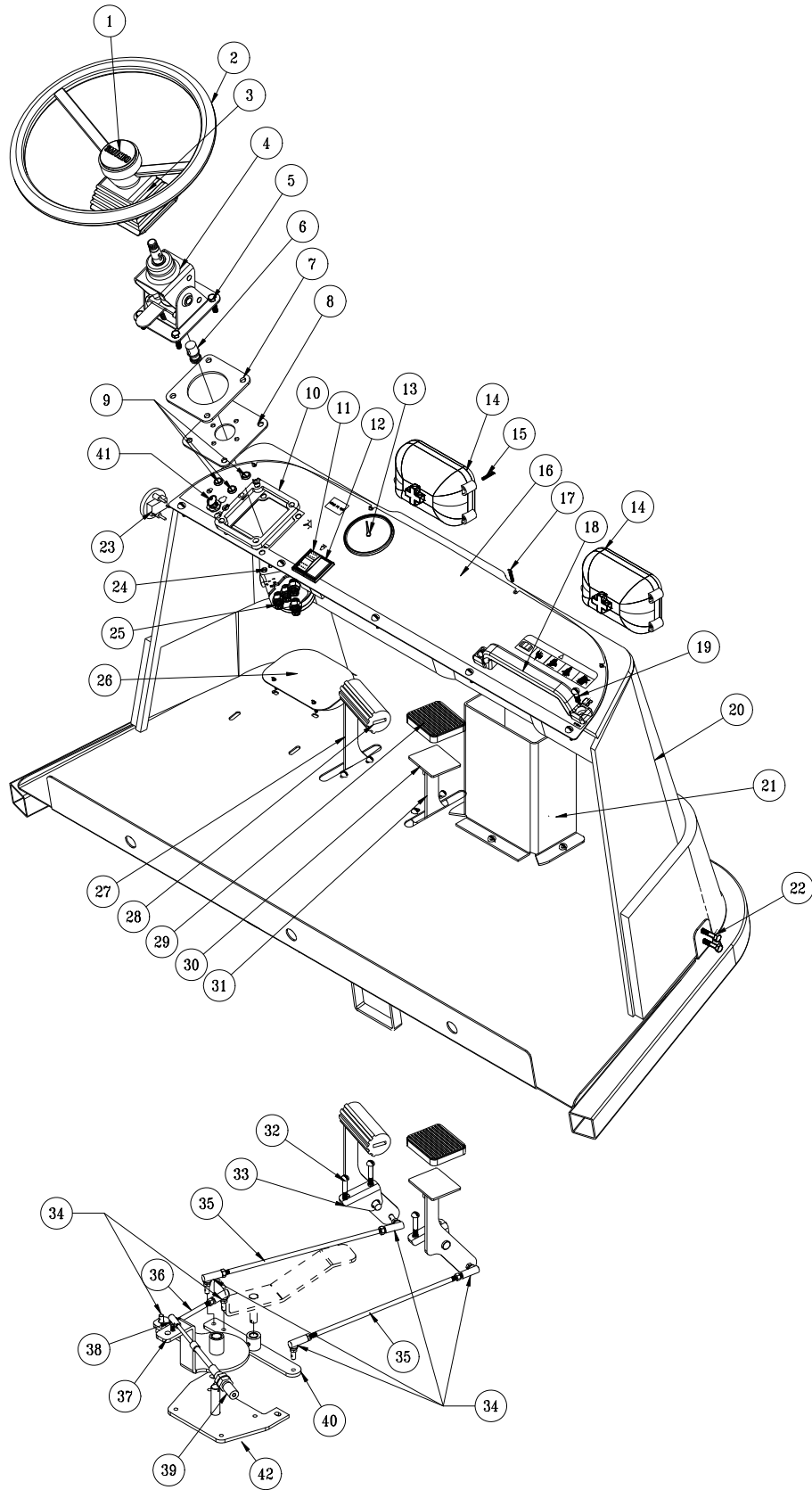
| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-------------------------------------|----------|
| 1 | 30-092 | Hydraulic Hose | 1 |
| 2 | 30-091 | Hydraulic Hose | 1 |
| 3 | 15-301 | Orbitrol | 1 |
| 4 | 30-094 | Hydraulic Hose | 2 |
| 5 | 15-839 | Hydraulic Cylinder | 1 |
| | 14-531 | Seal Kit | 1 |
| | 18-171 | 3/8 Seal Loc Adapter | 2 |
| 6 | 30-025 | Oil Tank | 1 |
| | 13-747 | Filler Breather | 1 |
| | 13-586-03 | Neck | 1 |
| 7 | 8833-9 | Suction Hose | 2 |
| | 18-222 | Hose Clamp | 4 |
| 8 | 8833-13 | Suction Hose | 1 |
| | 18-222 | Hose Clamp | 1 |
| 9 | 30-093 | Hydraulic Hose | 1 |
| 10 | 76-197 | Gear Pump | 1 |
| 11 | 30-102 | Eaton Closed Loop Pump | 1 |
| 12 | 18-405 | Run Tee | 1 |
| 13 | 30-086 | Hydraulic Hose | 1 |
| 14 | 30-085 | Hydraulic Hose | 1 |
| 15 | 30-090 | Hydraulic Hose | 2 |
| 16 | 30-087 | Hydraulic Hose | 2 |
| 17 | 30-099 | Wheel Drive | 2 |
| 18 | 30-100 | Hydraulic Release Brakes | 2 |
| 19 | 30-101 | Eaton Wheel Motors | 2 |
| 20 | 30-089 | Hydraulic Hose | 4 |
| 21 | 30-103 | Hot Oil Shuttle Manifold | 1 |
| 22 | 18-395 | Union Tee | 1 |
| 23 | 30-088 | Hydraulic Hose | 1 |
| 24 | 60-215 | Oil Filter Assembly | 1 |
| | 60-334 | Replacement Element | 1 |
| 25 | 8833-23 | Suction Hose | 1 |
| | 18-222 | Hose Clamp | 2 |
| 26 | 30-105 | Oil to Air Heat Exchanger | 1 |
| 27 | 18-308 | Swivel Tee | 1 |
| 28 | 30-104 | Brake and Manual Hand Pump Manifold | 1 |
| 29 | 8917-15.5 | Suction Hose | 1 |
| | 18-040 | Hose Clamp | 2 |
| 30 | 31-043 | Single Bank Valve | 1 |
| 31 | 31-021 | Hydraulic Hose | 1 |
| 32 | 31-020 | Hydraulic Hose | 1 |
| 33 | 31-019 | Hydraulic Hose | 1 |
| 34 | 72-040 | Hydraulic Cylinder | 1 |



BODY & FRAME PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|------------------------------|----------|
| 1 | 31-015 | Gondola Dump Box (Optional) | 1 |
| | 31-028 | Tailgate Dump Box (optional) | 1 |
| 2 | 30-008 | Roll Bar | 1 |
| 3 | 31-046 | Engine Hood (Fiberglass) | 1 |
| 4 | 27-055 | Flush Hinge | 2 |
| 5 | 31-045 | Seat Assembly (Fiberglass) | 1 |
| 6 | 14-270 | Seat | 2 |
| | 14-292 | Seat Switch | 1 |
| 7 | 76-198-03 | Seat Belt | 2 |
| 8 | 13-718 | 15" Steering Wheel | 1 |
| | 13-726 | Center Cap | 1 |
| 9 | 31-044 | Nose Cone (Fiberglass) | 1 |
| 10 | 32-014 | Head Light | 2 |
| 11 | 31-060 | Main Frame | 1 |
| 12 | 43-124 | Turf Tread Tire and Wheel | 2 |
| | 43-123-01 | Tire | 2 |
| | 43-058-02 | Wheel | 2 |
| | HNL-12-20 | Lug Nut 1/2 - 20 | 14 |
| 13 | 73-049 | Fuel Tank | 1 |
| | 73-051 | Fuel Tank Strap | 2 |
| | 73-050 | Cap with Gauge | 1 |
| 14 | 30-048-01 | Rear Tire | 2 |
| | 30-048-02 | Rear Wheel | 2 |
| | HNL-12-20 | Lug Nut 1/2 - 20 | 14 |
| 15 | 31-048 | T-Handle Latch | 1 |
| 16 | 76-443 | Black Handle | 2 |

NOSE CONE DRAWING

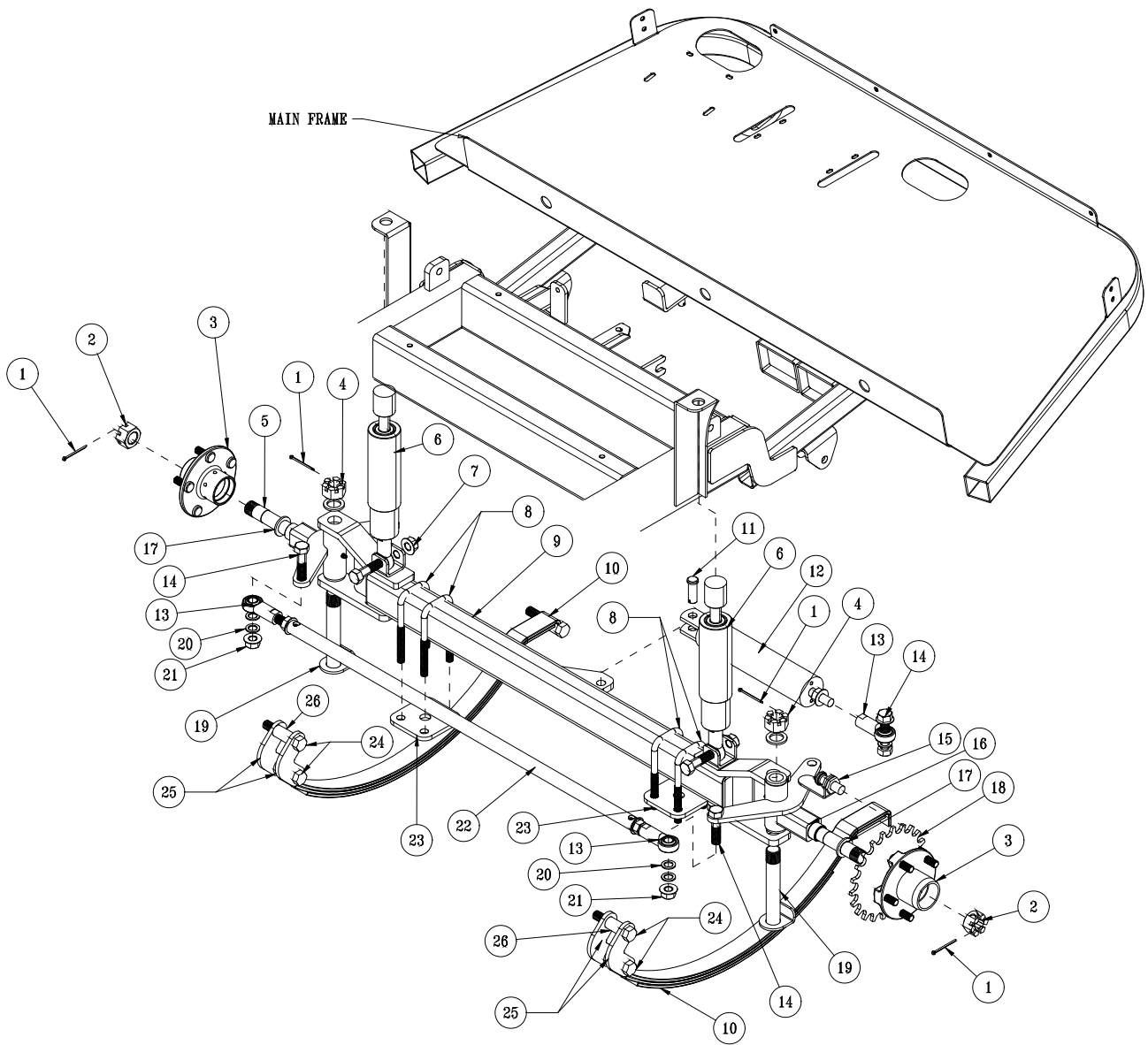


Parts

NOSE CONE PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|---|----------|
| 1 | 13-726 | Center Cap | 1 |
| | 27-077 | Decal, Smithco Round | 1 |
| 2 | 13-718 | 15" Steering Wheel | 1 |
| 3 | 76-364 | Square Boot | 1 |
| 4 | 76-362 | Mini Tilt steering | 1 |
| 5 | HB-516-18-125 | Bolt ⁵ / ₁₆ - 18 x 1 ¹ / ₄ | 4 |
| | HNFL-516-18 | Flange Whiz Lock Nut ⁵ / ₁₆ -18 | 4 |
| 6 | 48-187 | Stub shaft | 1 |
| 7 | 15-844 | Tilt Steering Spacer | 1 |
| 8 | 31-056 | Tilt Steering Plate | 1 |
| 9 | 50-359 | Warning Indicator Light | 3 |
| 10 | 31-057 | Steering Spacer | 1 |
| 11 | 15-725 | Mount Panel End | 1 |
| | 15-727 | Switch Actuator | 1 |
| | 15-782 | Rocker Switch, Unlit | 1 |
| 12 | 15-725 | Mount Panel End | 1 |
| | 15-730 | Mount Panel Plug | 1 |
| 13 | 10-556 | Speedometer | 1 |
| 14 | 32-014 | Head Light | 2 |
| 15 | HSM-10-32-100 | Machine Screw #10 -32 x 1 | 8 |
| | HNFL-10-32 | Flange Whiz Lock Nut #10 -32 | 8 |
| 16 | 31-051 | Dash Panel | 1 |
| | 31-067 | Decal, Dash Panel | 1 |
| 17 | HSM-10-32-100 | Machine Screw #10 -32 x 1 | 9 |
| | HNFL-10-32 | Flange Whiz Lock Nut #10 -32 | 9 |
| 18 | 76-443 | Black Handle | 1 |
| 19 | HSTP-516-18-100 | Phillips Machine Screw ⁵ / ₁₆ -18 x 1 | 2 |
| | HNFL-516-18 | Flange Whiz Lock Nut ⁵ / ₁₆ -18 | 2 |
| 20 | 31-044 | Nose Cone (fiberglass) | 1 |
| 21 | 31-062 | Hose Guard | 1 |
| 22 | HSTP-516-18-150 | Phillips Machine Screw ⁵ / ₁₆ -18 x 1 ¹ / ₂ | 7 |
| | HNFL-516-18 | Flange Whiz Lock Nut ⁵ / ₁₆ -18 | 7 |
| 23 | 12-017 | Hour Meter | 1 |
| 24 | 15-301 | Orbitrol | 1 |
| 25 | 7-867 | SAE # 6 Adapter | 4 |
| 26 | 31-070 | Floorboard Cover | 1 |
| 27 | 10-163 | Forward Foot Pedal | 1 |
| 28 | 48-066 | Pedal Grip | 1 |
| 29 | 15-015 | Pedal Pad | 1 |
| 30 | 16-062 | Pedal Pad Plate | 1 |
| | HB-38-16-125 | bolt ³ / ₈ -16 x 1 ¹ / ₄ | 1 |
| | HNFL-38-16 | Flange Whiz Lock Nut ³ / ₈ - 16 | 1 |
| 31 | 31-050 | Reverse Pedal | 1 |
| 32 | HSTP-516-18-075 | Phillips Machine Screw ⁵ / ₁₆ -18 x ³ / ₄ | 4 |
| | HNFL-516-18 | Flange Whiz Lock Nut ⁵ / ₁₆ -18 | 4 |
| 33 | 76-296 | Pedal Mount | 2 |
| | 18-234 | Bushing | 4 |
| | HG-14-28-180 | Grease Zerk | 2 |
| 34 | 21-462 | Ball Joints | 6 |
| | HN-516-24 | Nut ⁵ / ₁₆ - 24 | 6 |
| 35 | 31-054 | Pedal Rod | 2 |
| 36 | 31-055 | Linkage Rod | 1 |
| 37 | 15-692 | Pedal Relay | 1 |
| 38 | 8-701 | Ball Joint | 2 |
| | HN-14-20 | Nut ¹ / ₄ - 20 | 2 |
| 39 | 13-632 | Push Pull Cable | 1 |
| 40 | 10-178 | Relay | 1 |
| | 18-234 | Bushing | 2 |
| | HG-14-28-180 | Grease Zerk | 1 |
| 41 | 13-488 | Ignition | 1 |
| 42 | 30-027 | Relay Plate | 1 |

FRONT AXLE DRAWING

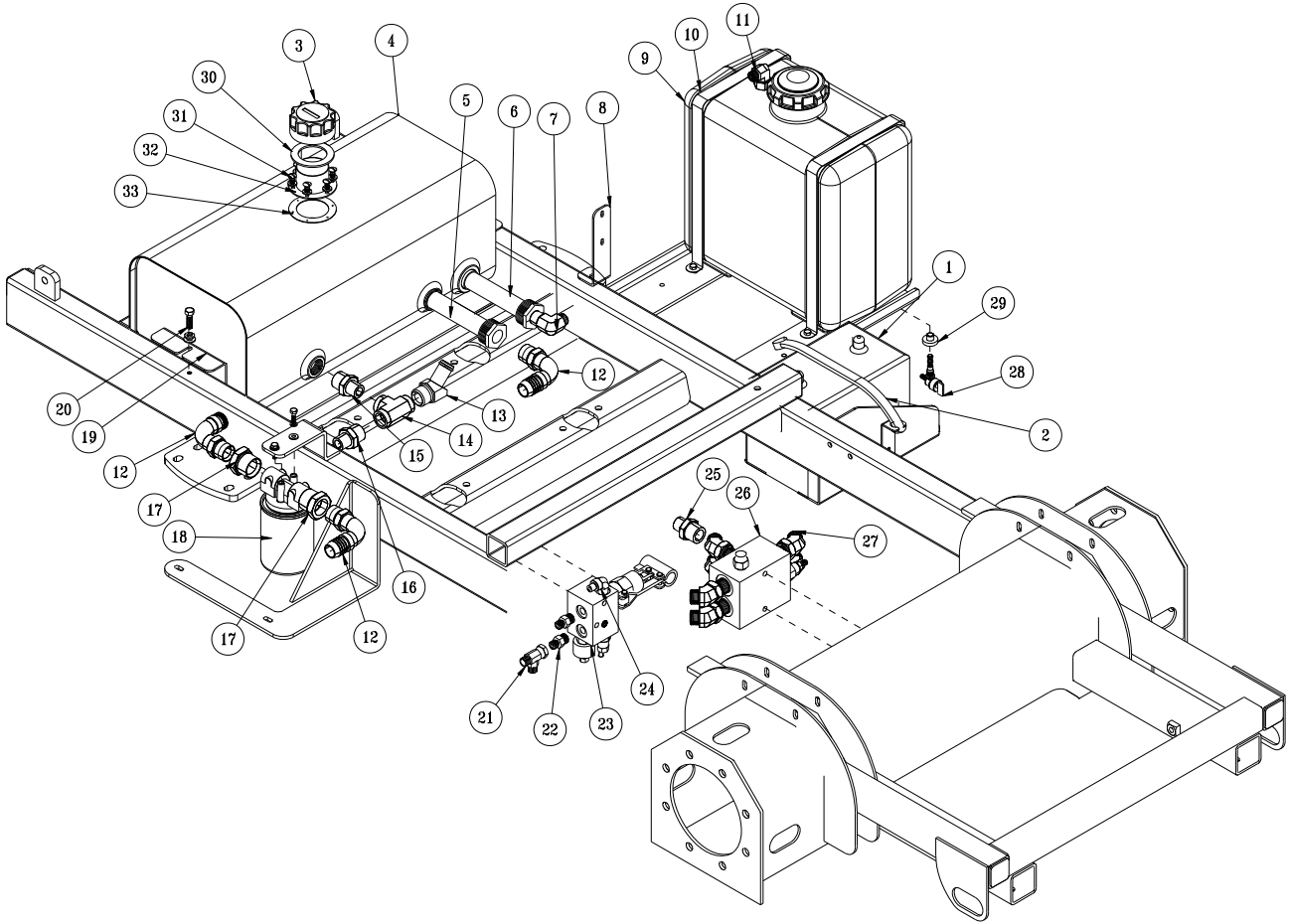


Parts

FRONT AXLE PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 1 | HP-18-150 | Cotter Pin $\frac{1}{8}$ - $1\frac{1}{2}$ | 2 |
| 2 | HNJ-58-18 | Jam Nut $\frac{5}{8}$ - 18 | 2 |
| 3 | 30-071 | Hub Assembly | 1 |
| 4 | HNAR-100-14 | Slotted Jam Nut 1 - 14 | 2 |
| 5 | 30-070 | Left Spindle | 1 |
| 6 | 20-617 | Shock Absorber | 2 |
| 7 | HB-58-11-300 | Bolt $\frac{5}{8}$ - 11 x 3 | 2 |
| | HNTL-58-11 | Lock Nut $\frac{5}{8}$ - 11 | 2 |
| 8 | 30-249 | U-Bolt | 4 |
| | HNFL-12-13 | FLange Lock Nut $\frac{1}{2}$ - 13 | 8 |
| 9 | 30-252 | Front Axle | 1 |
| 10 | 16-042 | Leaf Spring | |
| 11 | HCP-58-175 | Clevis Pin $\frac{5}{8}$ x $1\frac{3}{4}$ | 1 |
| | HP-18-100 | Cotter Pin $\frac{1}{8}$ x 1 | 1 |
| 12 | 15-839 | Hydraulic Cylinder | 1 |
| | 14-531 | Seal Kit | 1 |
| | 18-171 | $\frac{3}{8}$ Seal Loc Adapter | 2 |
| 13 | 18-154 | Rod End | 3 |
| | HG-14-28-90 | Grease Fitting $\frac{1}{4}$ - 28 x 90° | 3 |
| 14 | HB-58-11-250 | Bolt $\frac{5}{8}$ - 11 x $2\frac{1}{2}$ | 3 |
| 15 | 16-883 | Magnetic Sensor | 1 |
| 16 | 30-069 | Right Spindle | 1 |
| 17 | HMB-100-10 | Machine Bushing 1 x 10GA | 6 |
| 18 | 30-072 | Hub with Sprocket | 1 |
| 19 | 16-076 | King Pin | 2 |
| 20 | HMB-58-14 | Machine Bushing $\frac{5}{8}$ x 14GA | 6 |
| 21 | HNTL-58-11 | Lock Nut $\frac{5}{8}$ - 11 | 3 |
| 22 | 30-254 | Steering Link | 1 |
| 23 | 20-538 | Spring Mount | 2 |
| 24 | HB-916-18-325 | Bolt $\frac{9}{16}$ - 18 x 3-1/4 | 6 |
| | HNTL-916-18 | Lock Nut $\frac{9}{16}$ - 18 | 6 |
| 25 | 30-253 | Spring Shackle | 4 |
| 26 | 30-251 | Bushing (pressed in main frame) | 2 |

OIL AND FUEL TANK DRAWING

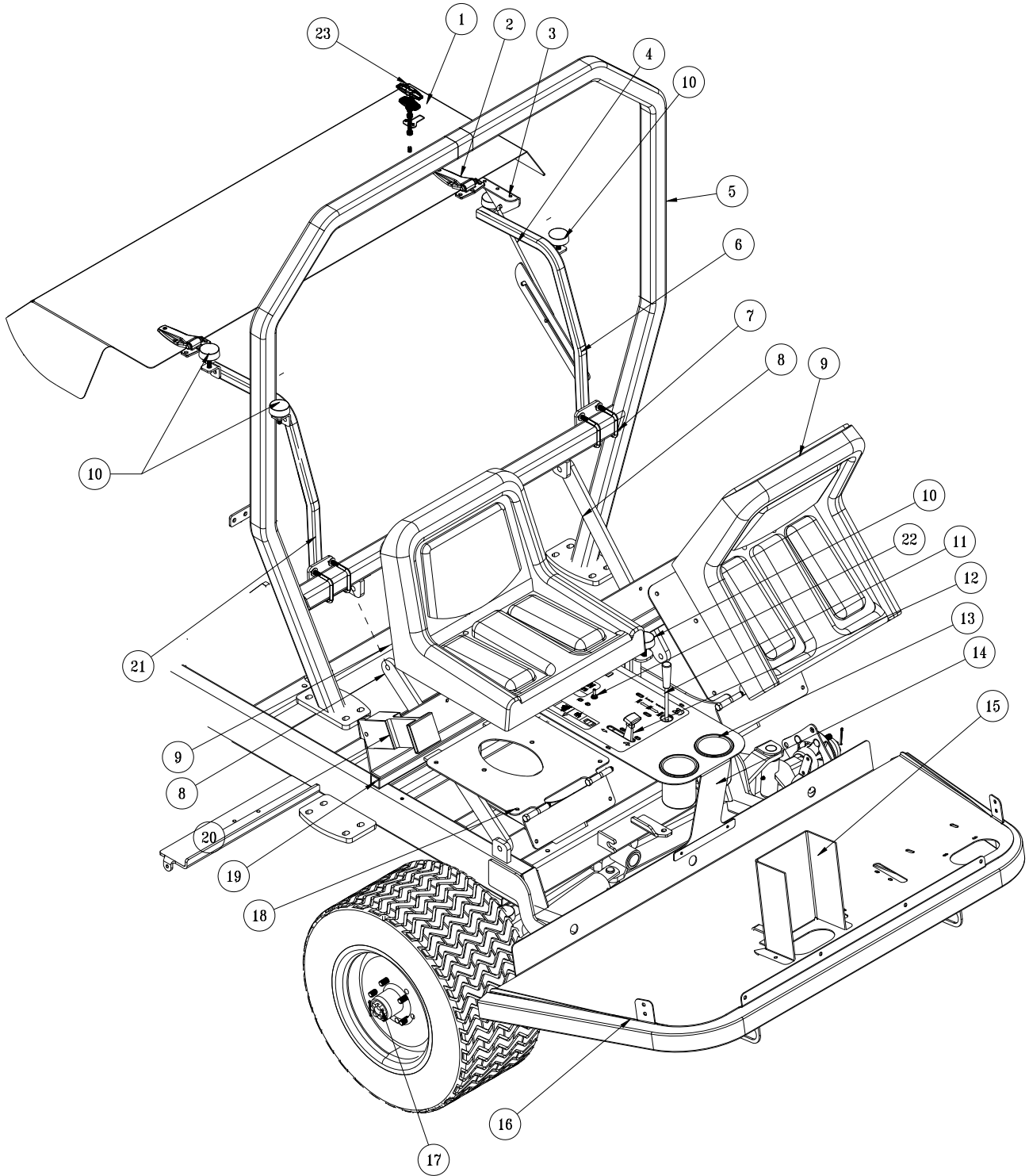


Parts

OIL AND FUEL TANK PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|----------------------------|----------|
| 1 | 33-216 | Battery | 1 |
| 2 | 8-603 | Battery Strap | 1 |
| 3 | 13-747 | Filler Breather | 1 |
| 4 | 30-025 | Oil Tank | 1 |
| | 18-069 | Pipe Plug | 1 |
| 5 | 60-213 | Strainer | 1 |
| 6 | 18-433 | Strainer | 1 |
| 7 | 18-398 | 90° Barb Fitting | 1 |
| 8 | 30-132 | Fuel Pump Mount | 1 |
| | 30-130 | Fuel Pump | 1 |
| 9 | 73-049 | Fuel Tank | 1 |
| | 73-050 | Cap with Gauge | 1 |
| 10 | 73-051 | Fuel Tank Strap | 2 |
| | HB-14-20-075 | Bolt 1/4 - 20 x 3/4 | 2 |
| | HB-14-20-150 | Bolt 1/4 - 20 x 1 1/2 | 2 |
| | HNFL-14-20 | Flange Lock Nut 1/4 - 20 | 4 |
| 11 | 30-125 | Top Draw Tube | 1 |
| | 9025-44 | 3/16 Fuel Hose 44" | 1 |
| | 18-186 | Hose Clamp | 2 |
| 12 | 18-397 | 90° Hose Barb Fitting | 3 |
| 13 | 18-407 | 5/8 45° Hose Barb Fitting | 1 |
| 14 | 18-399 | Tee | 1 |
| 15 | 18-400 | Pipe Nipple | 1 |
| 16 | 18-250 | Barb Fitting | 1 |
| 17 | 18-396 | Reducer | 2 |
| 18 | 72-146 | Oil Filter Assembly | 1 |
| | 60-334 | Replacement Filter | 1 |
| 19 | 30-063 | Oil Tank Hold-down | 2 |
| 20 | HB-38-16-125 | Bolt 3/8 - 16 x 1 1/4 | 2 |
| | HWL-38 | Lock Washer 3/8 | 2 |
| | HW-38 | Washer 3/8 | 2 |
| 21 | 18-308 | Swivel Tee | 1 |
| 22 | 18-306 | Straight Thread Connector | 2 |
| 23 | 30-104 | Manual Brake Pump Manifold | 1 |
| 24 | 18-171 | Seal Lock Elbow | 1 |
| 25 | 18-321 | Straight thread Connector | 1 |
| | 23-126 | O-ring plug | 1 |
| 26 | 30-103 | Hot Oil Shuttle Manifold | 1 |
| 27 | 18-393 | Elbow | 6 |
| 28 | 26-055 | Shut Off Valve | 1 |
| | 8940-40 | Fuel Hose | 1 |
| | 18-186 | Hose Clamp | 2 |
| 29 | 26-054 | Bushing Insert | 1 |
| 30 | 13-586-01 | Cap Gasket | 1 |
| 31 | HSM-10-32-063 | Machine Screw #10-32 x 5/8 | 6 |
| | HWL-10 | Lock Washer #10 | 6 |
| 32 | 13-586-03 | Fuel Tank Neck | 1 |
| 33 | 13-586-02 | Bottom Gasket | 1 |

SEAT PANEL DRAWING



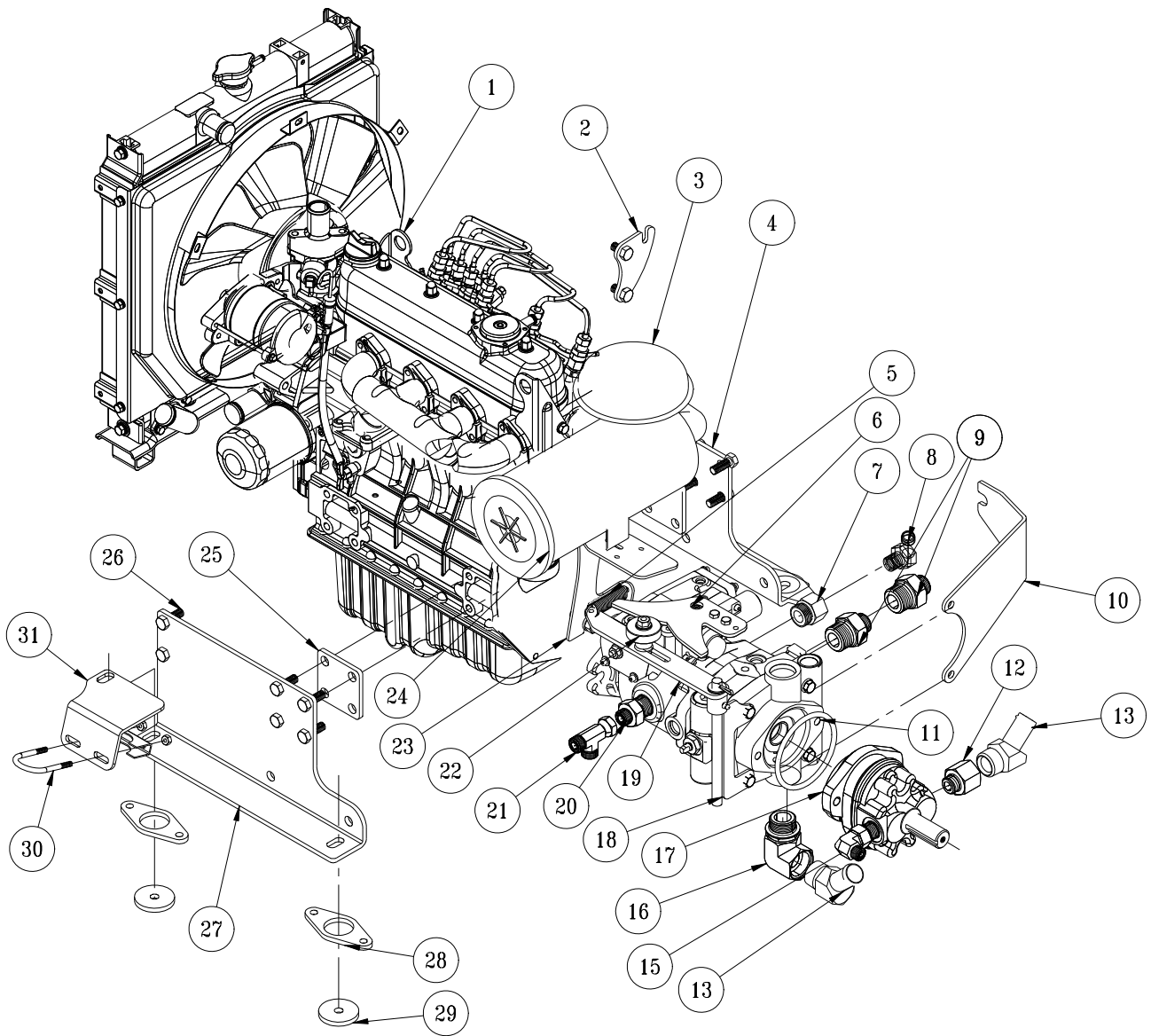
Parts

SEAT PANEL PARTSLIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|---|----------|
| 1 | 31-046 | Engine Cover (fiberglass) | 1 |
| 2 | 27-055 | Flush Hinge | 2 |
| | HSM 10-32-100 | Machine Screw #10-32-100 | 12 |
| | HNFL-10-32 | Flange Whiz Lock Nut # 10 - 32 | 12 |
| 3 | 31-058 | Rod Pivot | 1 |
| 4 | 31-059 | Hood Rod | 1 |
| | HW-516 | Washer ⁵ / ₁₆ | 2 |
| | HP-18-100 | Cotter Pin ¹ / ₈ x 1 | 2 |
| 5 | 30-008 | Roll Bar | 1 |
| 6 | 31-065 | LH Hood Support | 1 |
| 7 | 17-537 | U-Bolt | 4 |
| | HW-38 | Washer ³ / ₈ | 8 |
| | HNFL-38-16 | Flange Whiz Lock Nut ³ / ₈ - 16 | 8 |
| 8 | 30-032 | Roll Bar Brace | 2 |
| 9 | 14-270 | Seat | 2 |
| 10 | 50-081 | Rubber Bumper | 8 |
| | HNFL-38-16 | Flange Whiz Lock Nut ³ / ₈ -16 | 8 |
| 11 | 78-417 | Valve Handle | 1 |
| | 31-043 | Single Bank Valve | 1 |
| 12 | 34-160 | Throttle Cable | 1 |
| | 42-766 | Throttle Bracket | 1 |
| 13 | 15-781 | Drink Cup Holder | 2 |
| 14 | 31-053 | Center Console | 1 |
| | 30-097 | Decal, Console | 1 |
| 15 | 31-062 | Hose Cover | 1 |
| 16 | 31-060 | Main Frame | 1 |
| 17 | 43-124 | Turf Tread Tire and Wheel | 2 |
| | 43-123-01 | Tire | 2 |
| | 43-058-02 | Wheel | 2 |
| 18 | 31-052 | Seat Panel | 2 |
| 19 | 31-066 | Seat Frame | 1 |
| 20 | 76-198-03 | Seat Belt | 2 |
| 21 | 31-064 | RH Hood Support | 1 |
| 22 | 12-003 | Toggle Switch | 1 |
| | 30-143 | Toggle Switch Guard | 1 |
| 23 | 31-048 | T-Handle Latch | 1 |

ENGINE AND PUMPS DRAWING

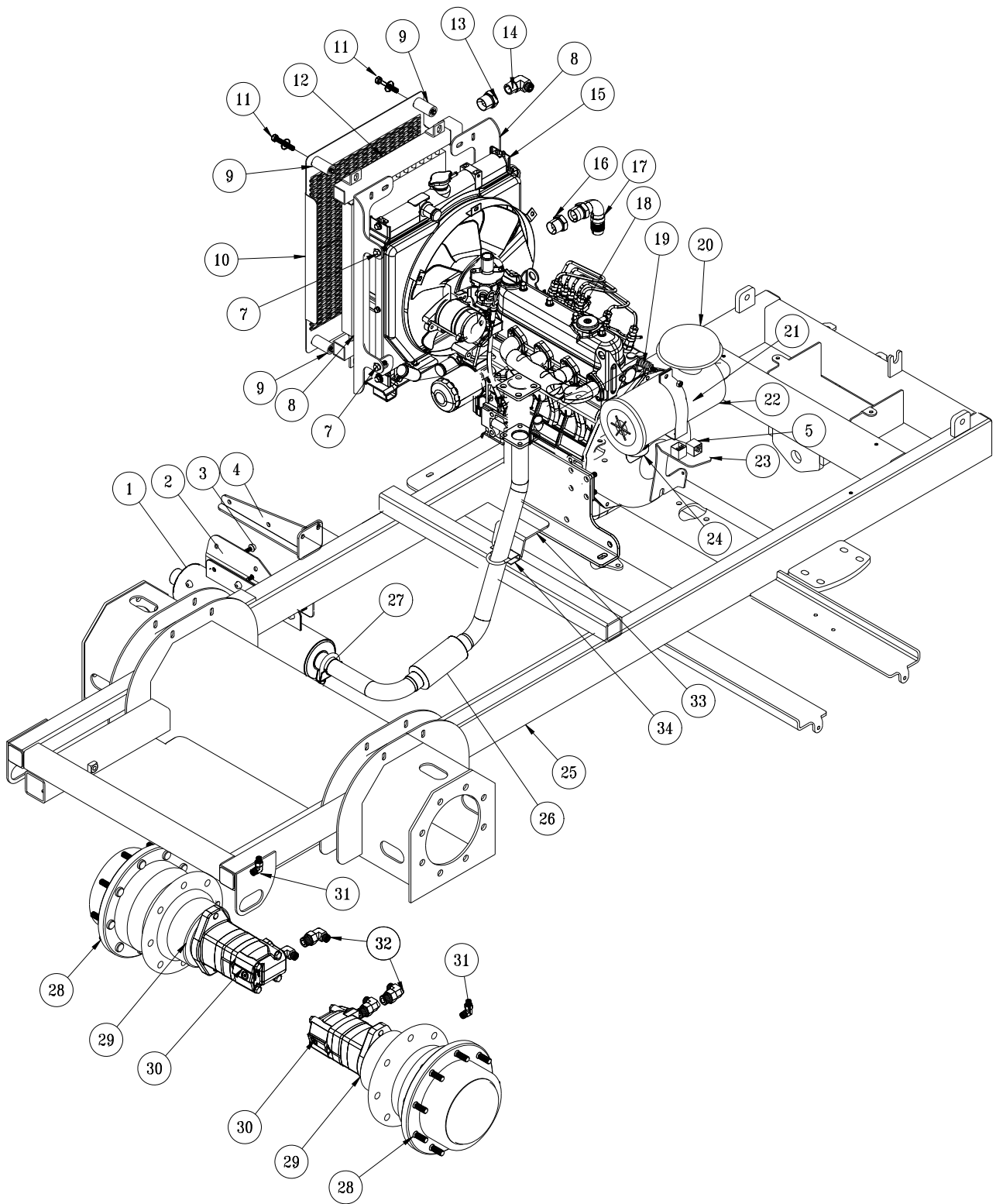
Parts



ENGINE, AND PUMPS PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|---------------|------------------------------|----------|
| 1 | 30-042 | Kubota Diesel Engine 33.5 HP | 1 |
| | 23-145 | O-ring | 1 |
| 2 | 30-033 | Throttle Cable Mount | 1 |
| | HBM-8-1.25-25 | Bolt #8-1.25 x 25 | 2 |
| | HWLM-8 | #8 Lock Washer | 2 |
| 3 | 42-004-02 | Air Cleaner Cap | 1 |
| 4 | 30-041 | Right Engine Mount | 1 |
| 5 | 48-109 | Spring | 1 |
| 6 | 30-037 | Shift Arm | 1 |
| | HB-14-20-075 | Bolt 1/4 - 20 x 3/4 | 2 |
| | HNCL-14-20 | Center Lock Nut 1/4 - 20 | 2 |
| 7 | 18-333 | Adapter | 1 |
| 8 | 23-143 | Connector | 1 |
| 9 | 18-403 | Adapter | 2 |
| 10 | 30-031 | Cable Mount | 1 |
| 11 | 30-102 | Eaton Closed Loop Pump | 1 |
| | 23-145 | O-ring | 1 |
| 12 | 23-136 | Straight Thread Reducer | 1 |
| 13 | 23-190 | 45° Elbow 3/4 MPT | 2 |
| 15 | 18-350 | 3/8 Elbow | 1 |
| 16 | 23-191 | Elbow | 1 |
| 17 | 76-197 | Gear Pump | 1 |
| | 76-197-08 | Seal Kit | 1 |
| 18 | 30-029 | Centering Arm Mount | 1 |
| 19 | 30-082 | Idler Arm | 1 |
| | HMB-12-14 | Machine Bushing 1/2 -14GA | 3 |
| | HP-18-075 | Cotter Pin 1/8 x 3/4 | 1 |
| 20 | 18-404 | Adapter | 1 |
| 21 | 18-405 | Run Tee | 1 |
| 22 | 14-266 | Ball Bearing | 1 |
| | 42-212 | Shift Arm Spacer | 1 |
| | HB-38-16-200 | Bolt 3/8 - 16 x 2 | 1 |
| | HW-38 | Washer 3/8 | 2 |
| | HN-38-16 | Nut 3/8 - 16 | 1 |
| 23 | 30-036 | Timer Spring Mount | 1 |
| | HB-12-13-125 | Bolt 1/2 - 13 x 1 1/2 | 1 |
| | HWL-12 | Lock Washer 1/2 | 1 |
| 24 | 30-042-02 | Air Cleaner | 1 |
| | 30-042-05 | Element | 1 |
| 25 | 30-038 | Kubota Spacer | 2 |
| 26 | HBM-10-1.5-30 | Bolt #10 - 1.5 x 30 | 12 |
| | HWLM-10 | #10 Lock Washer | 12 |
| 27 | 30-040 | Left Engine Mount | 1 |
| 28 | 30-042-01 | Engine Insulators | 4 |
| | HB-38-16-100 | Bolt 3/8 - 16 x 1 | 8 |
| | HNFL-38-16 | Flange Lock Nut 3/8 - 16 | 8 |
| 29 | 30-064 | Motor Washers | 4 |
| | HB-716-14-300 | Bolt 7/16 - 14 x 3 | 4 |
| | HW-716 | Washer 7/16 | 4 |
| | HNTL-716-14 | Lock Nut 7/16 | 4 |
| 30 | 50-111 | Muffler Clamp | 1 |
| 31 | 31-042 | Muffler Support | 1 |

COOLER AND EXHAUST DRAWING



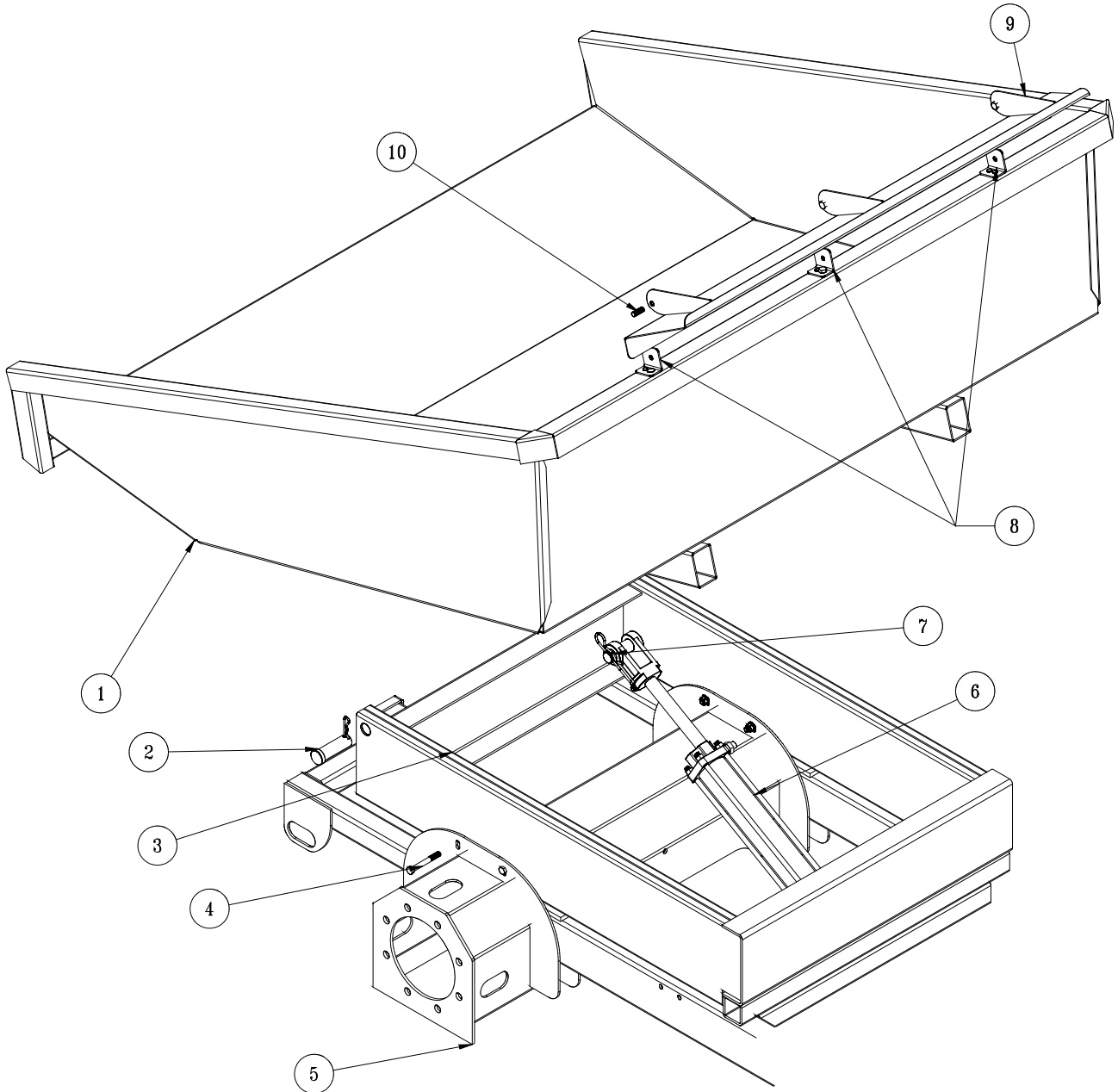
Parts

COOLER AND EXHAUST PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------------|--|----------|
| 1 | 30-269 | Muffler | 1 |
| 2 | 31-061 | Muffler Hanger | 1 |
| 3 | HBFL-516-18-075 | Flange Bolt, $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 4 |
| | HNFL-516-18 | Flange Nut, $\frac{5}{16}$ - 18 | 4 |
| 4 | 31-012 | Muffler Mount | 1 |
| 5 | 30-042-06 | Relay (part of engine) | 1 |
| 6 | 77-223 | Timer (part of engine) | 1 |
| 7 | HBM-6-1-16 | Metric Bolt M6 - 1 - 16 | 4 |
| | HWLM-6 | Metric Washer M6 | 4 |
| | HW-14 | Washer $\frac{1}{4}$ | 4 |
| 8 | 30-028 | Cooler Mount | 2 |
| 9 | 60-406 | Spacer | 4 |
| 10 | 30-043 | Oil Cooler Cover | 1 |
| 11 | HB-38-16-275 | Bolt $\frac{3}{8}$ - 16 x $2\frac{3}{4}$ | 4 |
| | HNFL-38-16 | Flange Lock Nut $\frac{3}{8}$ - 16 | 4 |
| 12 | 30-105 | Thermal Transfer Heat Exchanger | 1 |
| 13 | 18-107 | Pipe Thread Reducer | 1 |
| 14 | 18-402 | $\frac{3}{4}$ x 90° Hose Barb | 1 |
| 15 | | Radiator | 1 |
| 16 | 18-408 | Tube End Reducer | 1 |
| 17 | 18-397 | 90° Hose Barb | 1 |
| 18 | 30-042 | Kubota 33.5 HP Diesel Engine | 1 |
| 19 | | Hardware | |
| 20 | 42-004-02 | Air Cleaner Cap | 1 |
| 21 | 30-042-03 | Clamp | 1 |
| 22 | 30-042-02 | Air Cleaner Body | 1 |
| | 30-042-05 | Element | 1 |
| | 30-042-07 | Inlet Hose | 1 |
| 23 | 30-036 | Timer/Spring Mount | 1 |
| 24 | 30-042-04 | Evacuator Valve | 1 |
| 25 | 31-060 | Main Frame | 1 |
| 26 | 77-217 | Exhaust Manifold gasket | 1 |
| 27 | 50-111 | Muffler Clamp | 1 |
| 28 | 30-099 | Auburn Wheel Drive | 2 |
| 29 | 30-100 | Micro Spring Hydraulic Brakes | 2 |
| 30 | 30-101 | Eaton 2000 Series Hydraulic Motor | 2 |
| | 30-101-11 | Seal Kit | 2 |
| 31 | 18-394 | Elbow | 2 |
| 32 | 18-301 | Straight Thread Elbow | 4 |
| 33 | 31-042 | Muffler Support | 1 |
| 34 | 50-111 | Muffler Clamp | 1 |

31-015 GONDOLA DUMP BOX DRAWING

Parts

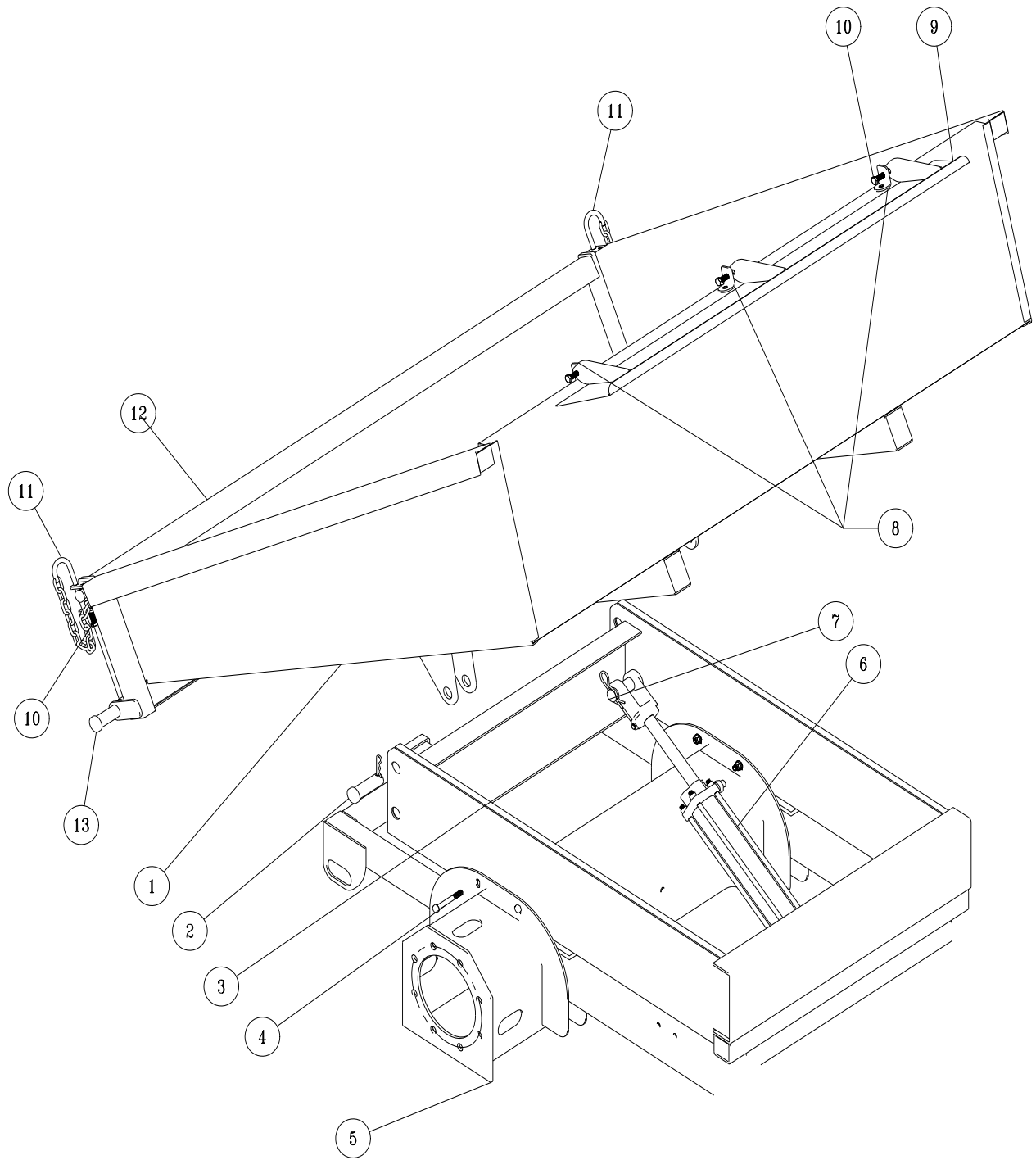


31-015 GONDOLA DUMP BOX PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------------|---|----------|
| 1 | 31-035 | Dump Box | 1 |
| 2 | HCP-100-325 | Clevis Pin 1 x 3 ¹ / ₄ | 2 |
| | HHP-18 | Bridge Pin 1 ¹ / ₈ | 1 |
| 3 | 31-011 | Box Base | 1 |
| 4 | HB-38-16-300 | Bolt, 3 ³ / ₈ -16 x 3 | 4 |
| | HNTL-38-16 | Lock Nut, 3 ³ / ₈ - 16 | 4 |
| 5 | 31-060 | Main Frame | 1 |
| 6 | 72-040 | Hydraulic Cylinder | 1 |
| | 72-040-01 | Seal Kit | 1 |
| | 23-184 | Fitting | 2 |
| 7 | 72-040-02 | Clip and Pin (comes with cylinder) | 2 |
| 8 | 31-014 | Dump Guard Hinge | 3 |
| | HB-38-16-100 | Bolt, 3 ³ / ₈ -16 x 1 | 6 |
| | HNFL-38-16 | Flange Lock Nut, 3 ³ / ₈ - 16 | 6 |
| 9 | 31-013 | Dump Guard | 1 |
| 10 | HB-38-16-100 | Bolt, 3 ³ / ₈ -16 x 1 | 3 |
| | HNFL-38-16 | Flange Lock Nut, 3 ³ / ₈ - 16 | 3 |

31-028 CARGO TAILGATE BOX DRAWING

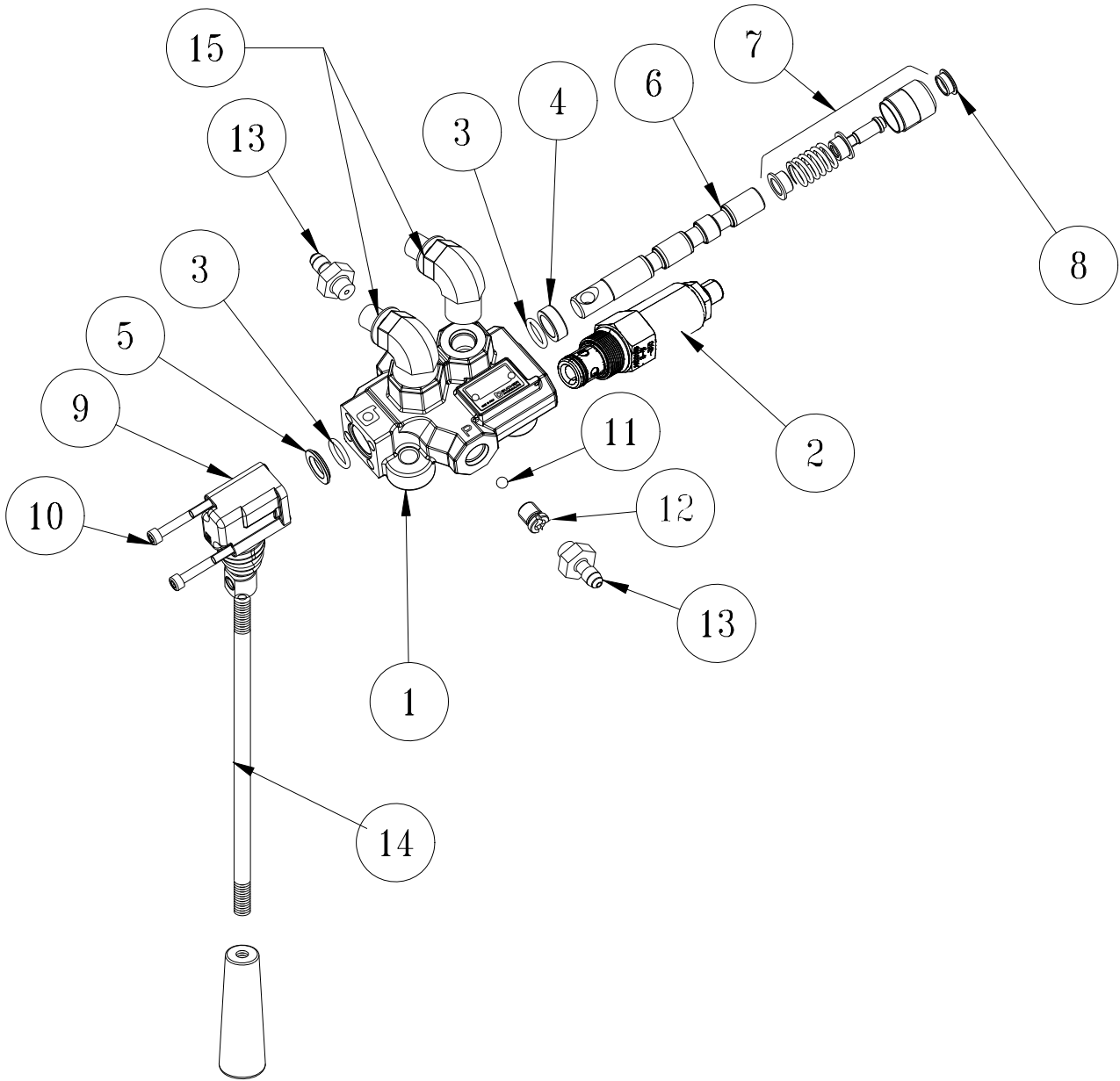
Parts



31-028 CARGO TAILGATE BOX PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|--------------|--|----------|
| 1 | 31-036 | Cargo Box | 1 |
| 2 | HCP-100-325 | Clevis Pin 1 x 3 ¹ / ₄ | 2 |
| | HHP-18 | Bridge Pin 1 ¹ / ₈ | 1 |
| 3 | 31-011 | Box Base | 1 |
| 4 | HB-38-16-300 | Bolt, 3 ³ / ₈ -16 x 3 | 4 |
| | HNTL-38-16 | Lock Nut, 3 ³ / ₈ - 16 | 4 |
| 5 | 31-060 | Main Frame | 1 |
| 6 | 72-040 | Hydraulic Cylinder | 1 |
| | 72-040-01 | Seal Kit | 1 |
| | 23-184 | Fitting | 2 |
| 7 | 72-040-02 | Clip and Pin (comes with cylinder) | 2 |
| 8 | 31-031 | Dump Guard Hinge | 3 |
| 9 | 31-030 | Dump Guard | 1 |
| 10 | HB-38-16-100 | Bolt, 3 ³ / ₈ -16 x 1 | 8 |
| | HNFL-38-16 | Flange Lock Nut, 3 ³ / ₈ - 16 | 8 |
| 11 | 31-032 | Tailgate Lock | 2 |
| 12 | 31-029 | Tailgate | 1 |
| 13 | HCP-34-250 | Clevis Pin 3 ³ / ₄ x 2 ¹ / ₂ | 2 |
| | 31-033 | 3 ³ / ₄ " Shaft Collar | 2 |

31-043 SINGLE-BANK HYDRAULIC VALVE DRAWING



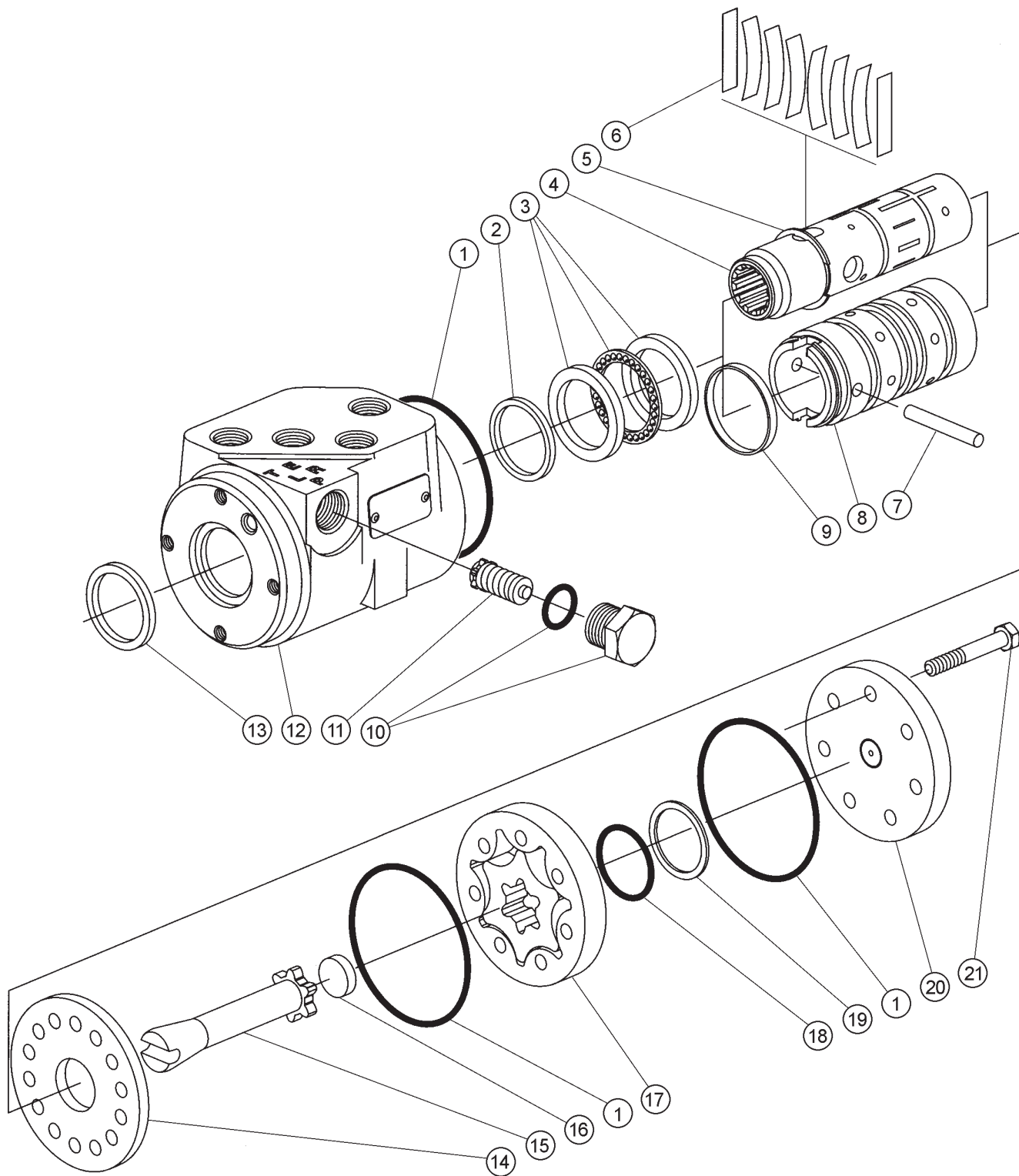
Parts

31-043 SINGLE-BANK HYDRAULIC VALVE PARTS LIST

| REF # | PART # | DESCRIPTION | QUANTITY |
|-------|-----------|--|------------|
| 1* | 13-731-01 | Actuator Housing Assembly | 1 |
| 2* | | Relief valve | 1 |
| 3*† | 78-415-03 | O-Ring Seal | 2 |
| 4*† | 78-415-05 | Spacer | 3 |
| 5* | 78-415-04 | Flanged Washer HDM10 | 3 |
| 6* | 13-731-03 | Spool | 1 |
| 7* | 78-415-11 | Positioner | 1 |
| 8* | 78-415-08 | Plug | 3 |
| 9* | 78-415-09 | Lever Group HDS11 | 3 |
| 10* | 78-415-10 | Metric Socket Screw M5 x .8 x 45 | 2 |
| 11* | 13-731-04 | 1/4" Ball | 1 |
| 12*† | 13-731-05 | Check Valve | 1 |
| 13 | 18-169 | Adapter | 2 |
| 14 | 78-417 | Straight Handle | 1 |
| | 78-417-01 | Knob | 1 |
| 15 | 18-171 | Elbow | 2 |
| * | 31-043 | Single Bank Hydraulic Valve (includes all * items) | |
| † | 13-731-01 | Actuator Housing Assembly | 1 per Bank |

15-301 ORBITROL DRAWING

Parts



15-301 ORBITROL PARTSLIST

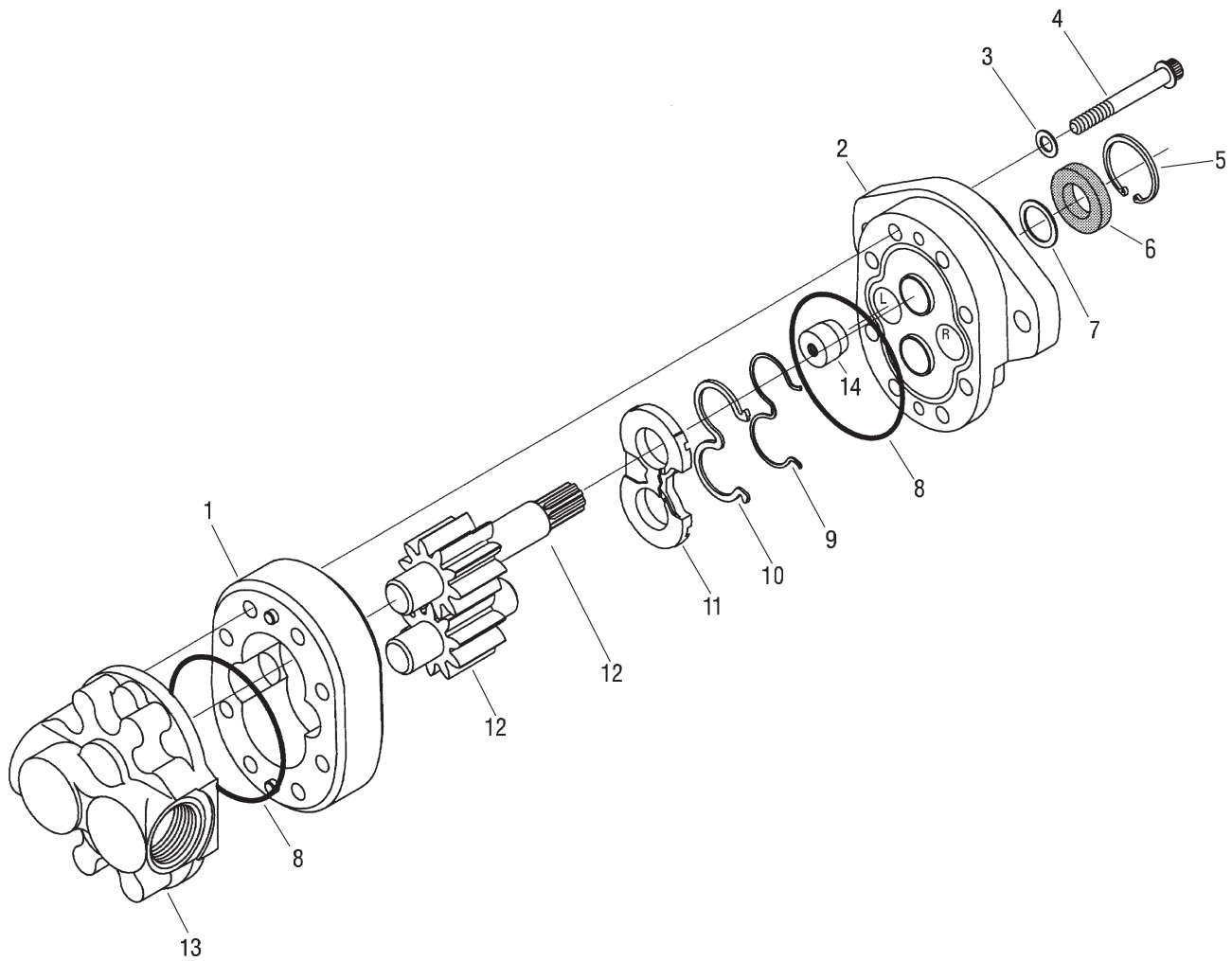
| REF # | PART # | DESCRIPTION | QUANTITY |
|-------|-----------|--|----------|
| 1* | | O-Ring Seal | 3 |
| 2* | | Quad Seal | 1 |
| 3 | 15-301-14 | Bearing Kit | 1 |
| | | Bearing Race | 2 |
| | | Bearing | 1 |
| 4 | | Spool | 1 |
| 5 | 15-301-13 | External Retaining Ring | 1 |
| 6 | 15-301-15 | Spring Centering Kit (Includes Ref# 9) | 1 |
| | | Spring Spacer | 2 |
| | | Centering Spring | 6 |
| | | Spring Retaining Ring | 1 |
| 7 | 15-301-08 | Pin | 1 |
| 8 | | Sleeve | 1 |
| 9 | | Retainer | 1 |
| 10 | 15-301-11 | Plug and O-ring | 1 |
| * | | O-Ring Seal | 1 |
| | | Plug | 1 |
| 11 | 15-301-12 | Relief Valve/Check (1015 psi (70 bar)) | 1 |
| 12 | | Housing | 1 |
| 13* | | Dust Seal | 1 |
| 14 | 15-301-06 | Wear Plate | 1 |
| 15 | 15-301-07 | Drive | 1 |
| 16 | 15-301-05 | Spacer | 1 |
| 17 | 15-301-04 | Gerotor | 1 |
| 18* | | O-Ring | 1 |
| 19* | | Seal | 1 |
| 20 | 15-301-03 | End Cap | 1 |
| 21 | 15-301-02 | Cap Screw | 7 |
| * | 15-301-01 | Seal Kit | |

15-301 ORBITROL SPECIFICATIONS

| | |
|--|--|
| Maximum System Pressure | 1015 psi (70 bar) |
| Maximum Back Pressure | 150 psi (10 bar) |
| Maximum System Operating Temperature. | 200°F (93°C) |
| Maximum Flow | 4 gpm (15 lpm) |
| Maximum Temperature Differential between Steering Unit and System. | 50°F (28°C) |
| Input Torque Powered | 15-25 lb/in @ 100 psi tank pressure (2-3 Nm @ 7 bar) |
| Input Torque Maximum Non-powered | 60 lb/ft (81 Nm) |
| Rotation Limits | None |
| Fluid | SAE 10W-40 API Service SJ or higher Motor Oil |
| Check Valve for Manual Steering | Yes |
| Relief Valve Setting | 1015 psi (70 bar) |
| Ports | ⁹ / ₁₆ - 18 SAE O-Ring 4 Ports |
| Displacement | 61 cu. in/ R (100 cu cm/R) |

76-197 EATON GEAR PUMP DRAWING

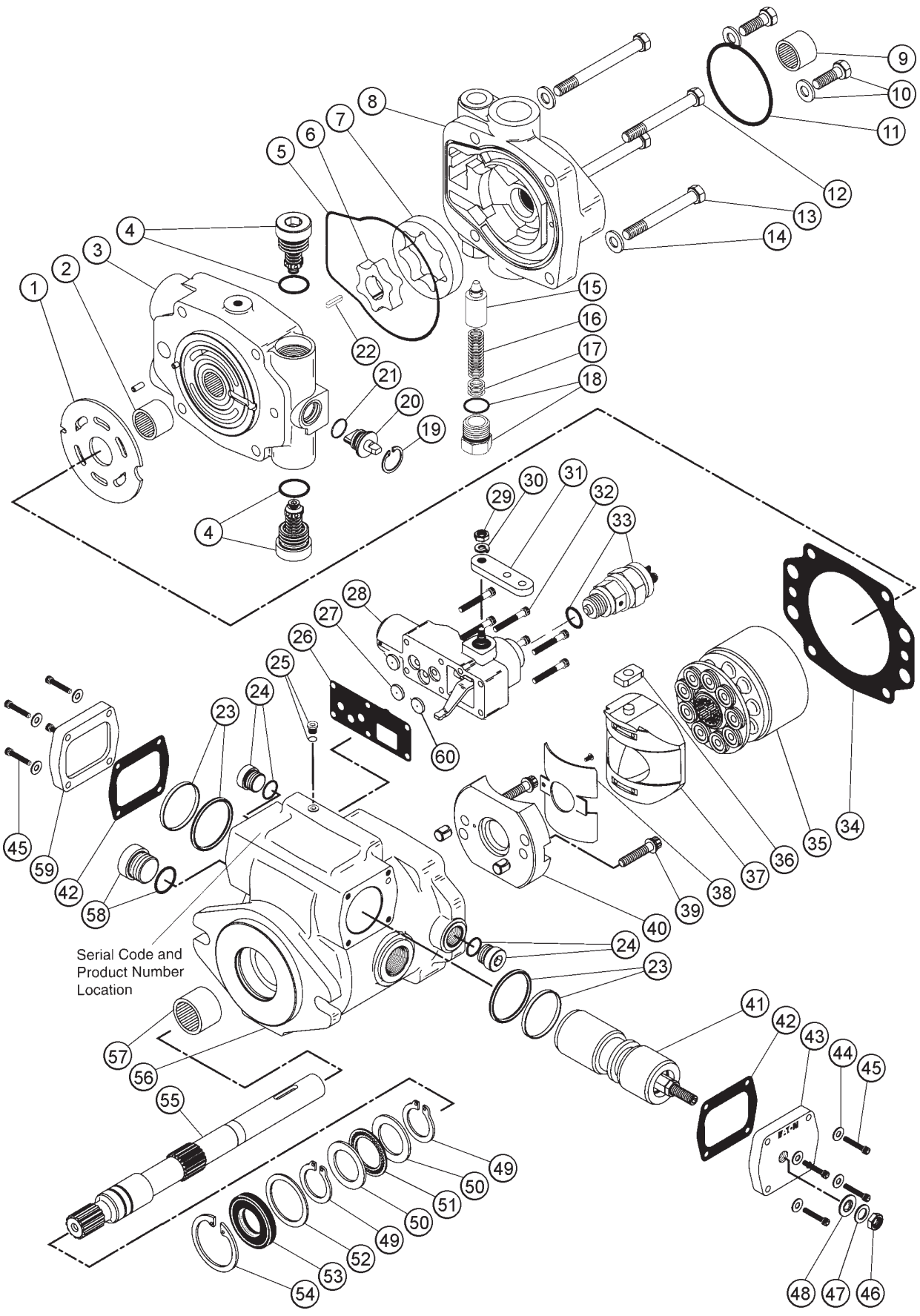
Parts



76-197 EATON GEAR PUMP PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|-------------------------------|----------|
| 1 | | Body | 1 |
| 2 | 76-197-01 | Front Plate | 1 |
| 3* | | Washer | 4 |
| 4 | 76-197-06 | Cap Screw | 8 |
| 5 | 76-197-07 | Retaining Ring | 1 |
| 6* | | Shaft Seal | 1 |
| 7 | 33-061-15 | Washer | 1 |
| 8* | | O-Ring | 2 |
| 9* | | Backup Gasket | 1 |
| 10* | | Seal | 1 |
| 11* | | Wear Plate | 1 |
| 12 | 76-197-04 | Shaft (comes with Idler Gear) | 1 |
| 13 | 76-197-02 | Back Plate | 1 |
| 14* | | Plug | 1 |
| * | 76-197-08 | Seal Kit | |

30-102 EATON PUMP DRAWING



Serial Code and Product Number Location

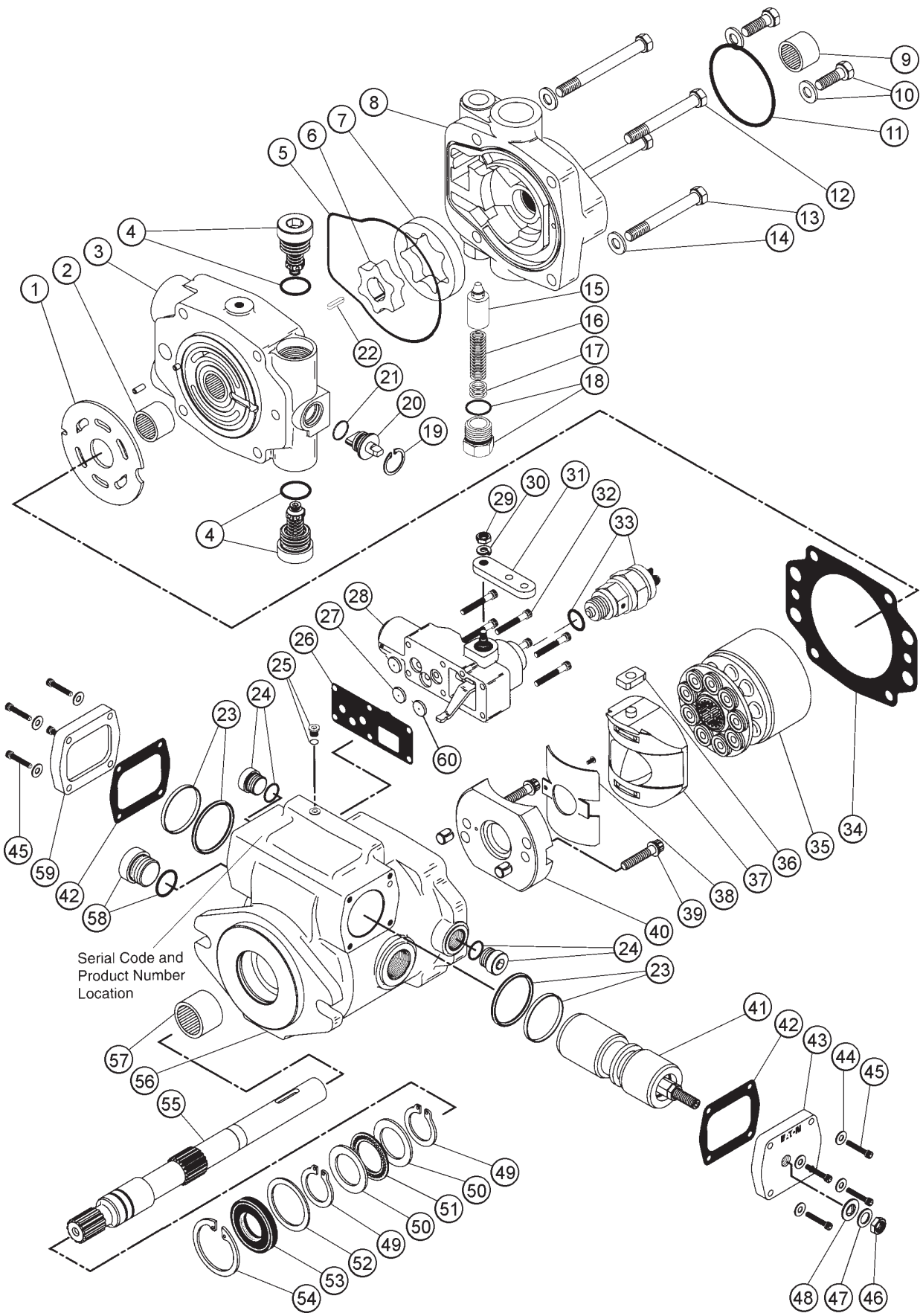
Parts

30-102 EATON PUMP PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|---|-------------|
| 1 | 33-058-16 | Valve Plate (CW Rotation) | 1 |
| 2 | 33-058-26 | Bearing (Press Fit) | 1 |
| 3 | 33-058-25 | Back Plate Assembly | 1 |
| 4 | 33-058-12 | Relief Valve S/A | 2 |
| * | | O-Ring | 2 |
| 5* | | Molded O-Ring | 1 |
| 6 | 33-058-38 | Inner Ring Gerotor | 1 |
| 7 | 33-058-39 | Outer Ring Gerotor | 1 |
| 8 | 33-058-35 | Charge Pump Adapter Assembly | 1 |
| 9 | 33-058-46 | Bearing (Press Fit) | 1 |
| 10 | | Bolt and Washer | 2 |
| 11* | | O-Ring | 1 |
| 12 | 33-058-14 | Cap Screw $\frac{3}{8}$ - 16 x 4 | 2 |
| 13 | 33-058-13 | Cap Screw $\frac{3}{8}$ - 16 x $3\frac{1}{2}$ | 2 |
| 14 | 33-058-44 | Washer | 4 |
| 15 | 33-058-50 | Poppet | 1 |
| 16 | 33-058-49 | Spring | 1 |
| 17 | 33-058-48 | Shims | As Required |
| 18 | 33-058-47 | Plug | 1 |
| * | | O-Ring | 1 |
| 19* | | Retaining Ring | 1 |
| 20 | 33-058-41 | Dump Valve Actuator | 1 |
| 21* | | Quad-Ring | 1 |
| 22 | 33-058-34 | Key | 1 |
| 23* | | Seal Sub-Assembly | 2 |
| 24 | 33-058-32 | Plug S/A | 2 |
| * | | O-Ring | 2 |
| 25 | 33-058-19 | Plug Sub-Assembly | 1 |
| * | | O-Ring | 1 |
| 26* | | Control Housing Gasket | 1 |
| 27 | 33-058-40 | Control Valve Orifice | 1 |
| 28 | 33-058-37 | Servo Control Assembly | 1 |
| 29 | 33-058-29 | Nut | 1 |
| 30 | 33-058-30 | Lockwasher | 1 |
| 31 | 33-058-36 | Control Arm | 1 |
| 32 | 33-058-15 | Cap Screw | 6 |
| 33 | 33-058-45 | Interlock Switch | 1 |
| 34* | | Housing Gasket | 1 |
| 35 | 33-058-04 | Rotating Kit Assembly | 1 |
| 36 | 33-058-06 | Servo Piston Follower | 1 |
| 37 | 33-058-09 | Cam Plate S/A | 1 |
| 38 | 33-058-22 | Bushing | 1 |
| 39 | 33-058-24 | Cap Screw | 2 |
| 40 | 33-058-20 | Cradle Sub-Assembly | 1 |
| 41 | 33-058-05 | Servo Piston Assembly | 1 |
| 42* | | Cover Plate Gasket | 2 |
| 43 | 33-058-08 | Cover Plate | 1 |
| 44 | 33-058-43 | Washer | 8 |
| * | 33-058-01 | Seal Repair Kit | |

(Continued on next page)

30-102 EATON PUMP DRAWING



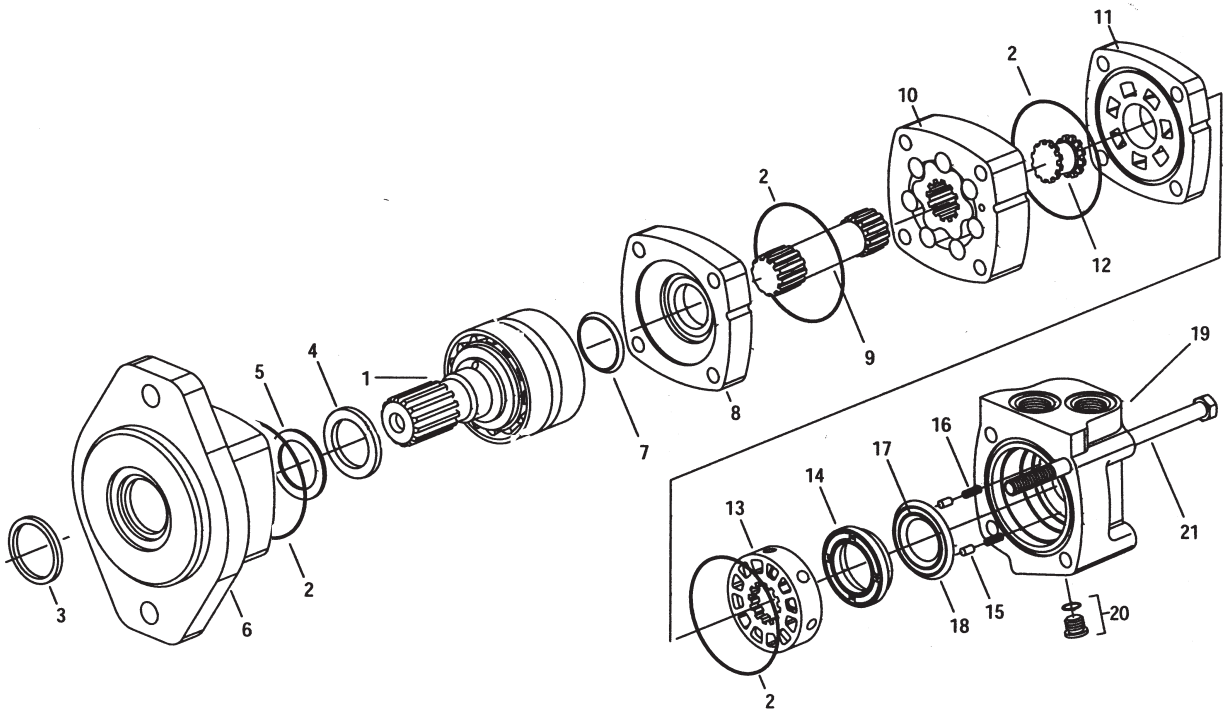
Serial Code and Product Number Location

Parts

30-102 EATON PUMP PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|------|-----------|------------------------|----------|
| 45 | 33-058-03 | Cap Screw #10 - 24 x 1 | 8 |
| 46 | 33-058-02 | Jam Nut | 1 |
| 47 | 33-058-42 | Washer | 1 |
| 48* | | Seal Washer | 1 |
| 49* | | Retaining Ring | 2 |
| 50 | 33-058-10 | Thrust Race | 2 |
| 51 | 33-058-11 | Thrust Bearing | 1 |
| 52 | 33-058-31 | Washer | 1 |
| 53* | 33-058-52 | Shaft Seal | 1 |
| 54* | | Retaining Ring | 1 |
| 55 | 33-058-28 | Drive Shaft | 1 |
| 56 | 33-058-17 | Housing Assembly | 1 |
| 57 | 33-058-18 | Bearing (Press Fit) | 1 |
| 58 | 33-058-33 | Plug S/A | 1 |
| * | | O-Ring | 1 |
| 59 | 33-058-07 | Cover Plate | 1 |
| 60 | 33-058-51 | Control Valve Orifice | 2 |
| * | 33-058-01 | Seal Repair Kit | |

30-101 EATON MOTOR DRAWING



Parts

30-101 EATON MOTOR PARTS LIST

| REF# | PART# | DESCRIPTION | QUANTITY |
|-----------|-----------|---|----------|
| 1 | 30-101-01 | Shaft and Bearing Kit (7/8 splined 13T) | 1 |
| 2* | | Seal | 4 |
| 3* | | Exclusion Seal | 1 |
| 4* | | Shaft Seal | 1 |
| 5* | | Back Up Ring | 1 |
| 6 | 30-101-02 | Bearing Housing | 1 |
| 7* | | Shaft Face Seal | 1 |
| 8 | 30-101-03 | Wear Plate | 1 |
| 9 | 30-101-04 | Main Drive | 1 |
| 10 | 30-101-05 | Geroler | 1 |
| 11 | 30-101-06 | Valve Plate | 1 |
| 12 | 14-207 | Valve Drive | 1 |
| 13 | 14-208 | Valve | 1 |
| 14 | 30-101-07 | Balance Ring | 1 |
| 15 | 14-210 | Balance Ring Pin | 2 |
| 16 | 14-209 | Compression Spring | 2 |
| 17* | | Inner Face Seal | 1 |
| 18* | | Outer Face Seal | 1 |
| 19 | 30-101-08 | Valve Housing | 1 |
| 20 | 30-101-09 | Plug Assembly | 1 |
| * | | O-ring | 1 |
| 21 | 30-101-10 | Cap Screw | 4 |
| * | 30-101-11 | Seal Kit | 1 per |

DECAL LIST

This is a list of decals located on the Dump Truck. Part number, description and location will help in reordering decals.

| | | |
|--------|----------------------------|--|
| 25-277 | Decal, Battery Warning | Battery |
| 16-088 | Decal, Warning | Belt Guard |
| 25-286 | Decal, Pinch Point | Both Sides of Seat Panel |
| 25-298 | Decal, Warning Hot | Cooler Guard, Above Muffel on Tank Side, Panel Behind Seat |
| 25-321 | Decal, Refuel w/ Diesel | Front Right Tank |
| 25-356 | Decal, Tire Pressure 20psi | Front Tires |
| 25-371 | Decal, Diesel | Sides of Engine Cover |
| 25-376 | Decal, 98 dBA | Panel Behind Seat |
| 25-380 | Decal, Tire Pressure 30psi | Rear Tires |
| 27-077 | Decal Smithco | Steering Wheel |
| 27-093 | Decal, Hydraulic Oil Level | Oil Tank |
| 31-067 | Decal, Dashboard | Dashboard |
| 30-117 | Decal, Ultra Fuel | Fuel Tank |
| 30-097 | Decal, Side Control Panel | Right Side Panel |
| 34-147 | Decal, Smithco Logo | Nose Cone |
| 31-037 | Decal, TCV 5000 | Sides of Dump/Cargo Box |
| 30-150 | Decal, Console Panel | Between Seats on console |

QUICK REFERENCE REPLACEMENT PARTS

REPLACEMENT FILTERS

| | |
|-----------|--|
| 72-146 | Hydraulic Oil Filter Assembly COMPLETE |
| 60-334 | Oil Filter Element |
| 30-042-05 | Air Cleaner Cartridge |
| 13-488 | Key Switch |
| 30-042-08 | Fuel Filter Element |
| 30-042-09 | Engine Oil Filter |
| 77-217 | Exhaust Muffler Gasket |

SEAL KITS

| | |
|-----------|---------------------------------|
| 15-301 | Power Steering Orbital Motor |
| 15-301-01 | Seal Kit |
| 15-839 | Steering Cylinder |
| 14-531 | Seal Kit |
| 30-101 | Wheel Motors |
| 30-101-11 | Seal Kit |
| 30-102 | Hydrostatic Pump |
| 33-058-01 | Seal Kit |
| 76-197 | Gear Pump |
| 76-197-08 | Seal Kit |
| 72-040 | Hydraulic Cylinder |
| 72-040-01 | Seal Kit |
| 72-040-02 | Pin with Clips (2 per Cylinder) |
| 31-043 | Single Bank Valve |
| 13-731-01 | Seal Kit |

FLUIDS

| | |
|-----------------|---|
| Engine Oil | SAE 10W-40 API Service SJ or higher Motor Oil |
| Hydraulic Fluid | SAE 10W-40 API Service SJ or higher Motor Oil |

The Smithco Commercial Products Two-Year Limited Warranty

Smithco, Inc. (Smithco) warrants your 2007 or newer Smithco Commercial Product ("Product") purchased after January 1, 2007, to be free from defects in materials or workmanship for the period of time listed below. Where a warrantable condition exists, Smithco will repair the Product at no cost to you including diagnosis, labor (at the Smithco standard labor rate, subject to the Smithco flat rate schedule), and parts.

Warranty Duration is:

- (1) Two years, 1500 operational hours* from the date of delivery to the original purchaser or three years from the date of original manufacturer of the product, whichever occurs first. (*Products equipped with hour meter).
- (2) Products used in rental situations are covered for 90 days from date of delivery to original user/ renter.

Owner Responsibilities:

As the Product owner, you are responsible for required maintenance and adjustments stated in your Owner's Manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim. **You are particularly responsible to train all present and future operators of this product on the safe operation of this product at your location.**

Instructions for Obtaining Warranty Service:

You are responsible for notifying the Authorized Smithco Products Distributor from whom you purchased the Product as soon as you believe a warrantable condition exists and not later than 30 days from discovery of the condition.

If you need help locating an Authorized Smithco Distributor, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Smithco Product Support Department
200 W Poplar PO Box 487
Cameron, Wisconsin 54822

Telephone: 1-800-891-9435

E-Mail: ProductSupport@smithco.com

Maintenance Parts:

Parts scheduled for replacement as required maintenance ("Maintenance Parts"), are warranted for the period of time up to the scheduled replacement time for that part.

Items/Conditions Not Covered:



Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. The items/conditions listed below are not covered by this warranty:



Product failures which result from the use of non-Smithco replacement parts, or from installation and use of add-on, modified, or unapproved accessories are not covered.



Product failures which result from failure to perform required maintenance and/or adjustments are not covered.



Product failures that result from operating the Product in an abusive, negligent or reckless manner are not covered.



This warranty does not apply to parts subject to consumption through use, unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to: blades, tines, teeth, scarifiers, rakes, plates, wear plates, castor wheels, tires, batteries, filters, belts, nozzles, etc.



This warranty does not apply to failures caused by out-side influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.



This warranty does not apply to normal “wear and tear” items. Normal “Wear and Tear” includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.



Smithco may require the return of failed parts or components in order to determine the validity of any warranty claim.



Smithco will not be obligated to replace components of other manufacturers if inspection by the original component manufacturer indicates that failure was due to normal wear and tear, expected consumption through use or improper care or service.

Other Legal Disclaimers:

The above remedy for product defects through repair or replacement by an authorized Smithco distributor or dealer is the purchaser’s sole remedy for any defect. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

THERE ARE NO OTHER EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH ABOVE. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE LIMITED TO THE DURATION OF THE LIMITED WARRANTIES CONTAINED HEREIN.

Some states may not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

THE SMITHCO COMPANY IS NOT LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE USE OF THE PRODUCT, INCLUDING ANY COST OR EXPENSE OF PROVIDING A SUBSTITUTE PRODUCT OR SERVICE DURING PERIODS OF MALFUNCTION OR NON-USE.

Some states may not allow the exclusion of indirect, incidental or consequential damages, so the above exclusion may not apply to you.

Smithco neither assumes, nor authorizes any person to assume for it, any other liability in connection with the sale or use of this product.

SMITHCO, INC.

Wayne, PA 19087

