



**Gillison's** Variety  
Fabrication, Inc.

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## ASPARAGUS CART

Model Number:  
GVF 11020  
and wing sets

Manual Part Number: GA 2205

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## INTRODUCTION

The information in this publication describes the safety requirements, operation, maintenance and servicing of the GVF/Gillison's Asparagus Cart. Every effort has been made to provide correct and concise information to you, the operator, as available at the date of publication. Your GVF/Gillison's dealer is available should items in this book or details of your machine not be understood.

This book is supplied with each machine to familiarize the operator with proper instructions needed for operation and maintenance. Studying and adhering to these instructions will ensure optimum machine performance and longevity. A machine that is maintained properly and operated in the intended manner will provide greater dividends than one that is neglected and/or operated in a manner other than as intended. Design and servicing of this machine has been kept as simple as possible to permit maintenance operations to be carried out with tools normally available.

This book should be thoroughly read and understood prior to operation of this machine. Inexperienced operators should study contents of this publication and receive instruction from an experienced operator when possible. Your GVF/Gillison's dealer can assist in areas concerning machine operation and provide details concerning safe operation. It is suggested that this booklet be kept readily accessible, preferably with the machine, for future reference if questions or concerns arise. If the original book should become lost or damaged, consult your GVF/Gillison's dealer in regards to acquiring a replacement.

Customers are strongly advised to use an authorized GVF/Gillison's dealer in connection with any service problems and adjustments that may occur.



**CAUTION: READ THIS BOOK IN ITS ENTIRETY PRIOR TO OPERATING THE MACHINE. Use only parts from your GVF/Gillison's dealer for repairs and/or replacement.**



## SAFETY

### INTRO TO SAFETY

The safety of the operator is one of the main concerns in designing a new piece of equipment. Designers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions. To avoid personal injury, study the following precautions and insist those working with you or for you follow them.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, the equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace shield prior to further operation.

### SAFETY ALERT SYMBOL




**FIG. 1:** This is the safety alert symbol. It means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!** Look for it, both in this manual and on safety decals on the equipment. It will direct your attention to information that involves your safety and the safety of others.



**FIG. 1**

### SIGNAL WORDS

**FIG. 2:** The words **DANGER**, **WARNING**, or **CAUTION** are used with the safety alert symbol. Learn to recognize these safety alerts, and follow the recommended precautions and safe practices.

-  **DANGER** indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.
-  **WARNING** indicates an imminently hazardous situation that, if not avoided, could result in death or serious injury.
-  **CAUTION** indicates an imminently hazardous situation that, if not avoided, may result in minor or moderate injury.



**FIG. 2**

Replace any **DANGER**, **WARNING**, **CAUTION** or instructional decal that is not readable or is missing. The locations and part numbers of these decals are identified later in this section of the manual.

### GENERAL SAFETY RULES

**FIG. 3: Always keep this manual with the machine.**

This manual must be made available to the operator of the machine at all times. Special care must be taken to keep this manual safe from the weather and in readable condition.

Read this manual carefully and learn how to use the machine correctly.

Do not let anyone operate this machine without thorough instruction.

**Beware of bystanders, particularly children!** Always look around to make sure that everyone is clear before starting the engine or moving the machine. This is particularly important with higher noise levels as you may not hear people shouting.

**FIG. 4: No passengers allowed.** Do not carry passengers anywhere on the machine.

**Dismount and park machine in the correct manner.** When dismounting and/or leaving the operator's platform FOR ANY REASON always:

1. Turn brake on.
2. Shut off engine.
3. Park on level ground.
4. Remove the key.



**WARNING:** An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not he/she can properly operate equipment.

**FIG. 5: Wear protective clothing.** Do not wear loose clothing, as this may catch on moving parts of the machine causing injury.

Always wear protective clothing and appropriate safety equipment.

It is recommended that suitable protective hearing and safety glasses be worn.

**Do not attempt to service machine, clear obstructions or unplug blockages with the engine running.** Always shut off the engine first.

**Keep all shields and guards in place.**

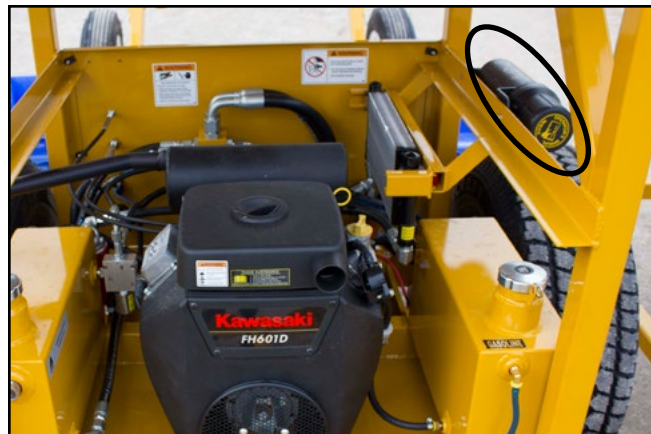


FIG. 3



FIG. 4



FIG. 5

**FIG. 6: Additional equipment:** A fire extinguisher and first aid kit should be carried with the machine or be kept readily available at all times.

Keep emergency telephone numbers for immediate access.

#### SAFETY WHILE OPERATING



**CAUTION: READ THIS BOOK IN ITS ENTIRETY PRIOR TO OPERATING MACHINE.**

Keep the machine properly maintained. Do not operate a machine when it is broken or has missing parts. Make sure that the maintenance procedures in this operator's manual are completed before using the machine.

Check all controls regularly and adjust where necessary.

Periodically check all nuts and bolts for tightness, especially wheel hub and rim nuts.

**Clear the area.** Ensure that all bystanders, particularly children, are in a safe position before starting the engine.

**Be observant of the operating area and terrain.** Watch for holes, rocks or other hidden hazards. ALWAYS inspect area prior to operation.

DO NOT operate near edge of banks. Setback distance from bank should equal or exceed the overall height of the bank.

DO NOT operate on steep slopes as overturning may result.

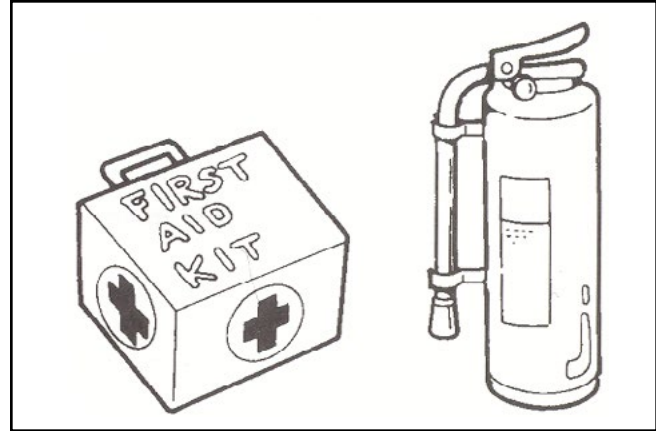
If necessary to cross a steep slope, avoid turning uphill. Slow down and make a wide turn. Travel directly up or down the slope, never cross it. Keep the heavy end of the machine on the uphill side.

**Make sure there is plenty of ventilation.** Never operate the engine in a closed building.

Always start and operate engine in a well-ventilated area.

If in an enclosed area, vent the exhaust to the outside.

Do not tamper with or modify the exhaust system with unapproved extensions.



**FIG. 6**



## SAFETY WHILE SERVICING THE MACHINE

**Stop the machine. DO NOT service the machine while the engine is running or hot, or if the machine is in motion.**

*NOTE: When making major repairs or complicated adjustments, it is recommended that you consult your GVF (Gillison's) Dealer and have the work carried out by trained personnel.*

The following precautions should be observed. These have been arranged by machine area or component.

### Electrical System

**FIG. 7: To prevent serious injury or death from exploding gases:**



**Do not work on batteries without proper instruction and training.**

**FIG. 8:** Before making adjustments or servicing the electrical system, disconnect the battery negative (-) cable (see 1) first to prevent short circuits.

Keep sparks, flames and cigarettes away. Use a flashlight to check the battery electrolyte level if necessary.

Do not produce sparks with cable clamps when charging the battery or starting the machine engine with a slave (jumper) battery.

Batteries contain sulfuric acid electrolyte. Always wear protective clothing and eye protection when servicing.

In case of electrolyte contact, rinse area with plenty of water and seek medical attention.

Batteries produce explosive hydrogen gas when charged. Charge in area with adequate ventilation. Halt charging if battery temperature exceeds 52°.

Wash hands after handling battery.

### Hydraulic System

**FIG. 9: High pressure fluid hazard.** To prevent serious injury or death:



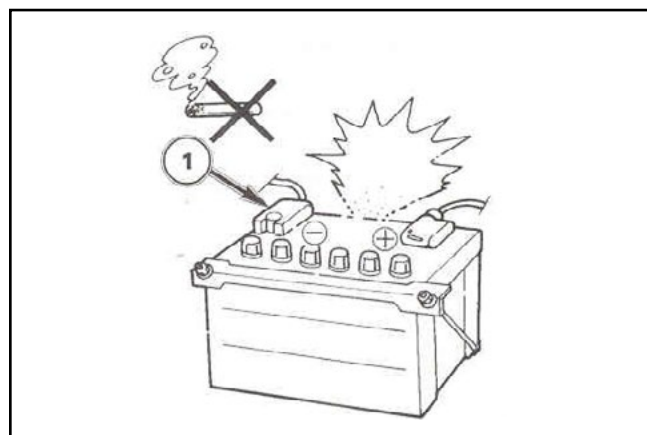
**Relieve pressure on system before repairing or adjusting or disconnecting.**

**Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands.**

**Keep all components in good repair.**



**FIG. 7**



**FIG. 8**



**FIG. 9**

Ensure that all hydraulic connections are tight.

Relieve all pressures before disconnecting hoses or lines. Escaping oil under pressure can cause serious injury.

All fluids should be handled with care. If you are injured by or swallow any fluid, seek medical attention immediately and show the label on the product.

Fluid escaping from a very small hole can be almost invisible and can penetrate the skin causing serious injury. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure. When checking for leaks always use a piece of cardboard or wood. Never use your hands to find a pressure leak.

If ANY fluid is injected into the skin, it must be attended to by a doctor immediately.

### Fuel System

**FIG. 10: Gasoline fuel is flammable and must be handled with care.**

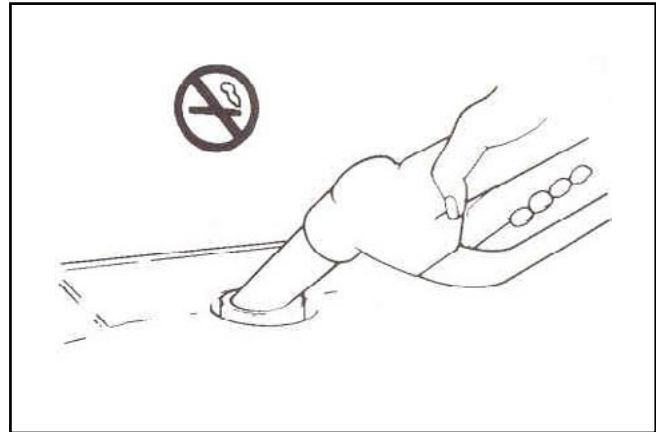
Never refuel or service the fuel system on the machine while smoking or when near open flames or sparks.

Never refuel the machine while the engine is running.

DO NOT use a fuel can unless necessary.

Always clean up any spilled fuel.

Fuel system components rely upon clean fuel for lubrication and optimum performance. Extreme care must be taken to prevent contamination from dirt and moisture to prevent damage.



**FIG. 10**

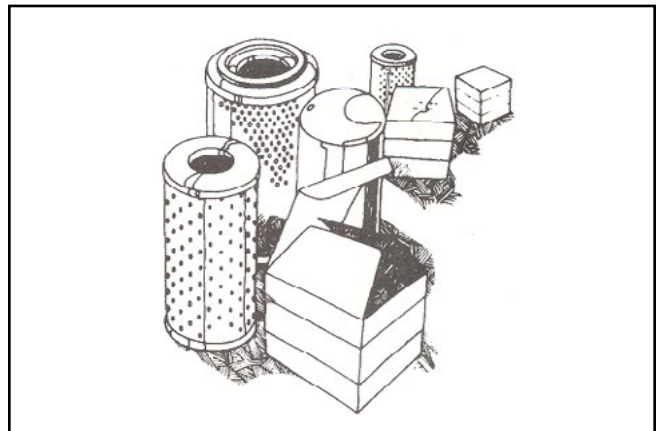
### Wheels and Tires

Do not attempt to service a tire unless you have the proper equipment and experience to perform the job. Have the work carried out by your GVF/Gillison's Dealer or a qualified repair service.

The machine must be supported on suitable blocks or stands, NOT a hydraulic jack.

When seating tire beads onto rims, never exceed 2.4 bar (35 psi) or the maximum inflation pressure specified on the tire. Inflation beyond this maximum pressure may break the bead, or even the rim, with dangerous, explosive force.

When preparing a calcium chloride solution for fluid blasting the tires, NEVER pour water onto the calcium chloride. A chlorine gas can be generated which is poisonous and explosive. This can be avoided by slowly adding calcium chloride flakes to water and stirring until they are dissolved.



**FIG. 11**



Wear suitable protective clothing, gloves, and eye/face protection.





### Replacement Parts

FIG. 11: Where replacement parts are necessary for periodic maintenance and servicing, replacement parts from GVF/Gillison's must be used to restore your equipment to original specifications.

GVF/Gillison's will not claim responsibility for installation of unapproved parts and/or accessories and damages as a result of their usage.

### INSTRUCTION DECALS

**FIG. 12:** Location of all instruction decals are provided as a reference. Corresponding numbers show where decals belong on the machine. Replace any decals that are damaged, missing or are not readable. Consult your dealer.

- 1) SP 6210, qty 1 - Decal, (SW700) High Pressure Fluid Hazard 
- 2) SP 6211, qty 1 - Decal, (SW500) Exploding Gases Warning 
- 3) SP 6212, qty 1 - Decal, (SW4) Caution - Read Manual 
- 4) SP 6223, qty 2 - Decal, Gillison's logo 2x12 

### SERIAL NUMBER

Location of serial number provided as a reference.

### MODIFICATIONS

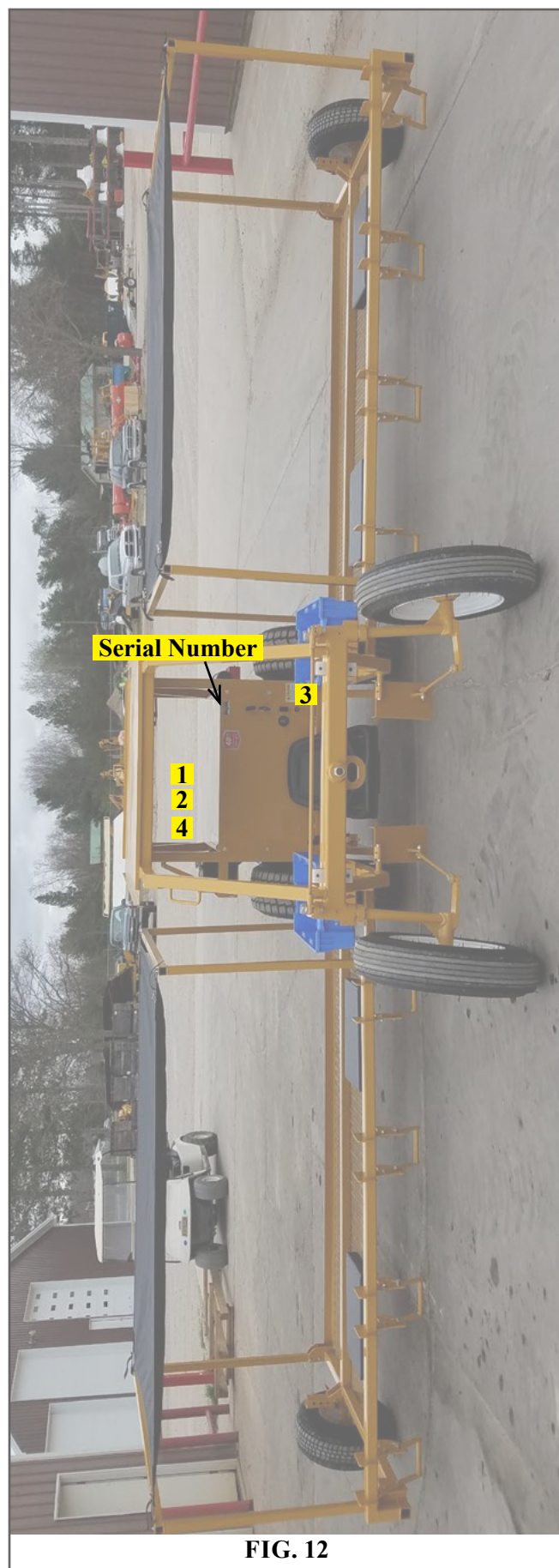
Modification or alteration of the equipment shall be made only with prior written consent from GVF/Gillison's Variety Fabrication Inc.

Altering safety devices shall be prohibited.

### RECORD RETENTION

The owner shall retain the following records for at least 3 years:

#### A. Purchase Information



**FIG. 12**

**B. Records of persons trained upon delivery of the equipment.**

**C. Written records of frequent inspections, maintenance performed and parts replaced**

#### **OWNERSHIP RECORDS**

When a change of ownership of the equipment occurs, it is the responsibility of the seller to notify GVF/ Gillison's Variety Fabrication Inc. with the following information within 60 days of the sale:

**A. Serial number of machine**

**B. Name & address of new owner**

## OPERATION

**Prior to operating** be sure to read this entire manual especially the sections containing safety information and operation information.

### STARTING

**Choke - pull out and hold.**

**Turn ignition switch CW to crank and start the engine. Push choke back in.**

**Allow time for the engine and hydraulic oil temperature to warm before operation.**

### INSTRUMENTS AND CONTROLS

#### Throttle

The throttle control cable is located to the left of the operator. Pull out and rotate clockwise to lock into position. To release and go to idle speed turn counter clockwise and push in. **FIG. 13**

#### Hour Meter

Hour Meter (measures hours of engine operation. Refer to meter for maintenance schedule) See **FIG. 13**

#### Forward & Reverse

Push forward to move machine forward. **FIG. 13**

#### Brake Switch

Switch flipped DOWN brake is ON.

Switch flipped UP (light appears) brake is OFF.

Engine must be running as brakes are hydraulically released. **FIG. 13**

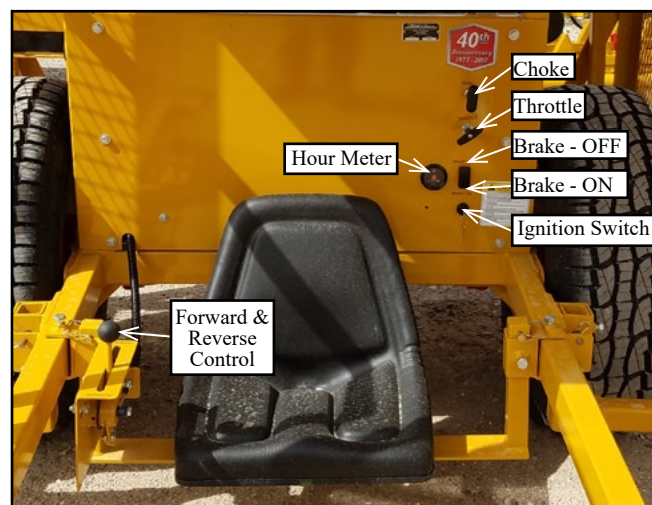
### DRIVING REQUIREMENTS

Under all travel conditions, the operator shall use careful discretion to gauge a safe travel speed. Take into consideration conditions of ground surface, congestion of area, visibility, slope, location of personnel, and other factors that could cause a hazardous situation.

The operator must report immediately any problems or malfunctions of the asparagus cart to a supervisor. If the problem concerns safety it shall be repaired prior to continued operation.

### UNAUTHORIZED USE

Means shall be used to prevent use of machine by unauthorized persons.



**FIG. 13**

**TRANSPORTING**

Once wings are up and pinned into place, (see steps 1 thru 3) back the asparagus cart onto a trailer for transporting.

1) Sun-shade collapses down. Do both sides.



2) Use pins to secure sun-shade frames in place.



3) Two people can lift the wing and then one can pin it in to place.



## **LUBRICATION & MAINTENANCE**

### **ENGINE LUBRICATION & MAINTENANCE**

Follow recommendations of engine manufacturer. Refer to engine manual.

### **GENERAL MACHINE LUBRICATION & MAINTENANCE**

All pivots with grease fittings should be greased weekly or every 50 hours of operation, whichever is met first.

#### **FIG. 14**

Check tire air pressure monthly. Refer to tire specifications for proper inflation.

Check wheel nut torque monthly.

### **HYDRAULIC SYSTEM**

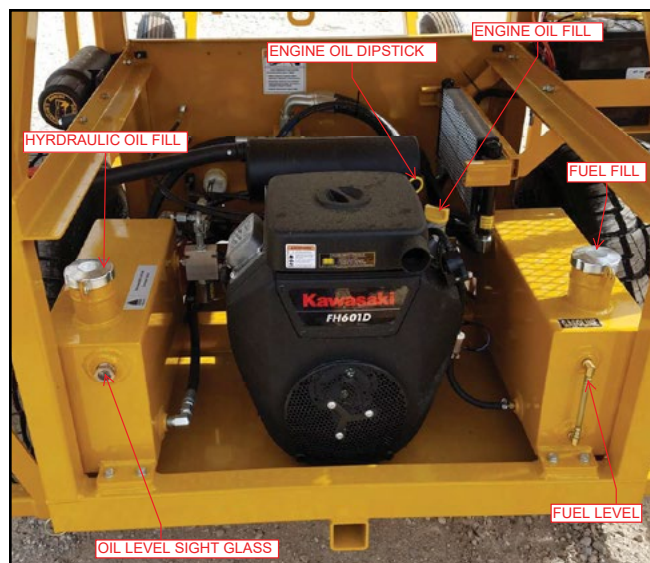
Fluid level must be checked daily. Reservoir must be kept full and free of contaminants.

Refer to hydraulic schematic for hydraulic oil specifications, part numbers and filters.

### **MAINTENANCE CHART**

| <b>ITEM</b>                     | Daily | 50 hrs | 200 hrs | 500 hrs | 1000 hrs |
|---------------------------------|-------|--------|---------|---------|----------|
| Check Oil Level and Cleanliness | ●     |        |         |         |          |
| Change Oil Filter               |       |        |         | ●       |          |
| Change Hydraulic Oil            |       |        |         |         | ●        |
| Grease Lubrication Points       |       | ●      |         |         |          |

**REFER TO ENGINE MANUAL FOR SERVICE INTERVALS AND DETAILED INFORMATION.**



**FIG. 14**

## ENGINE SPECIFICATIONS

GA 2150 Engine, 601CC horizontal, FH601D-FS01S



FH Series



## Technical Specifications

|                               |   |
|-------------------------------|---|
| § Engine Type                 | Air-cooled, 4-stroke, Horizontal shaft, OHV |
| § Number of cylinders         | 2   |
| § Bore x stroke               | 75.2 x 76 mm                                |
| § Displacement                | 675 cm <sup>3</sup>                         |
| § Max. power                  | 12.3 kW (16.4 hp) / 3600 rpm                |
| § Max. torque                 | 44.8 Nm (33.0 ft.lbs) / 2000 rpm            |
| § Fuel tank capacity (litres) |   |
| § Oil capacity (litres)       | 1.6 litres                                  |
| § Dry weight                  | 44.5 kg                                     |
| § Dimensions (L x W x H) (mm) | 442 x 430 x 491                             |

## Type

- § 4 Stroke
- § Air Cooled
- § V Twin
- § Overhead Valve
- § Horizontal Shaft

## Features

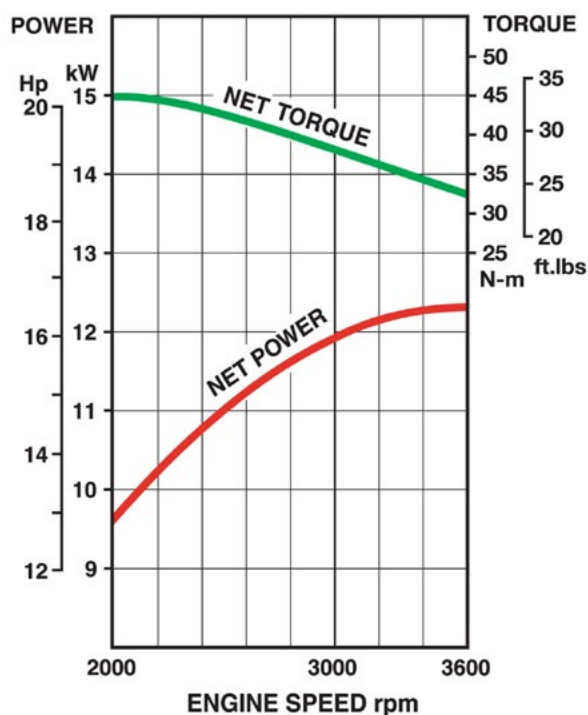
- § Cast iron cylinder liners
- § Dual element air filter
- § Internally vented carburetor
- § Overhead V-valves
- § Pressurised lubrication
- § Rotating grass screen

## Options

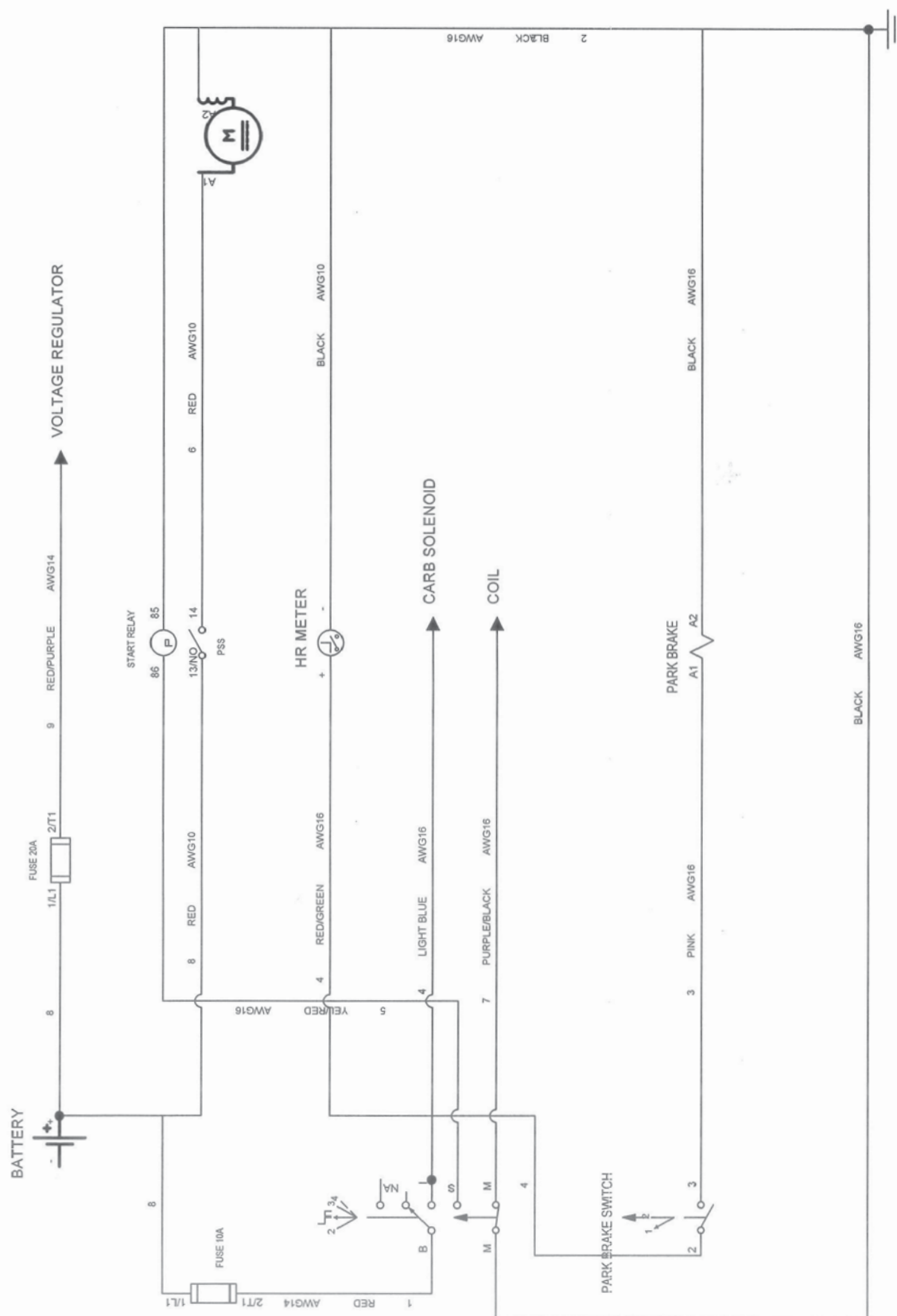
- § 13 or 20 Amp charge coil
- § Oil pressure switches
- § Shaft variations
- § Flywheel PTO
- § Various oil drains
- § Various speed control system

## Performance curves

The power rating of this engine is the Net power rating tested on a production engine and measured in accordance with SAE J1349. Actual power output will vary depending on numerous factors, including, but not limited to, the operating speed of the engine in application, environmental conditions, maintenance, and other variables.

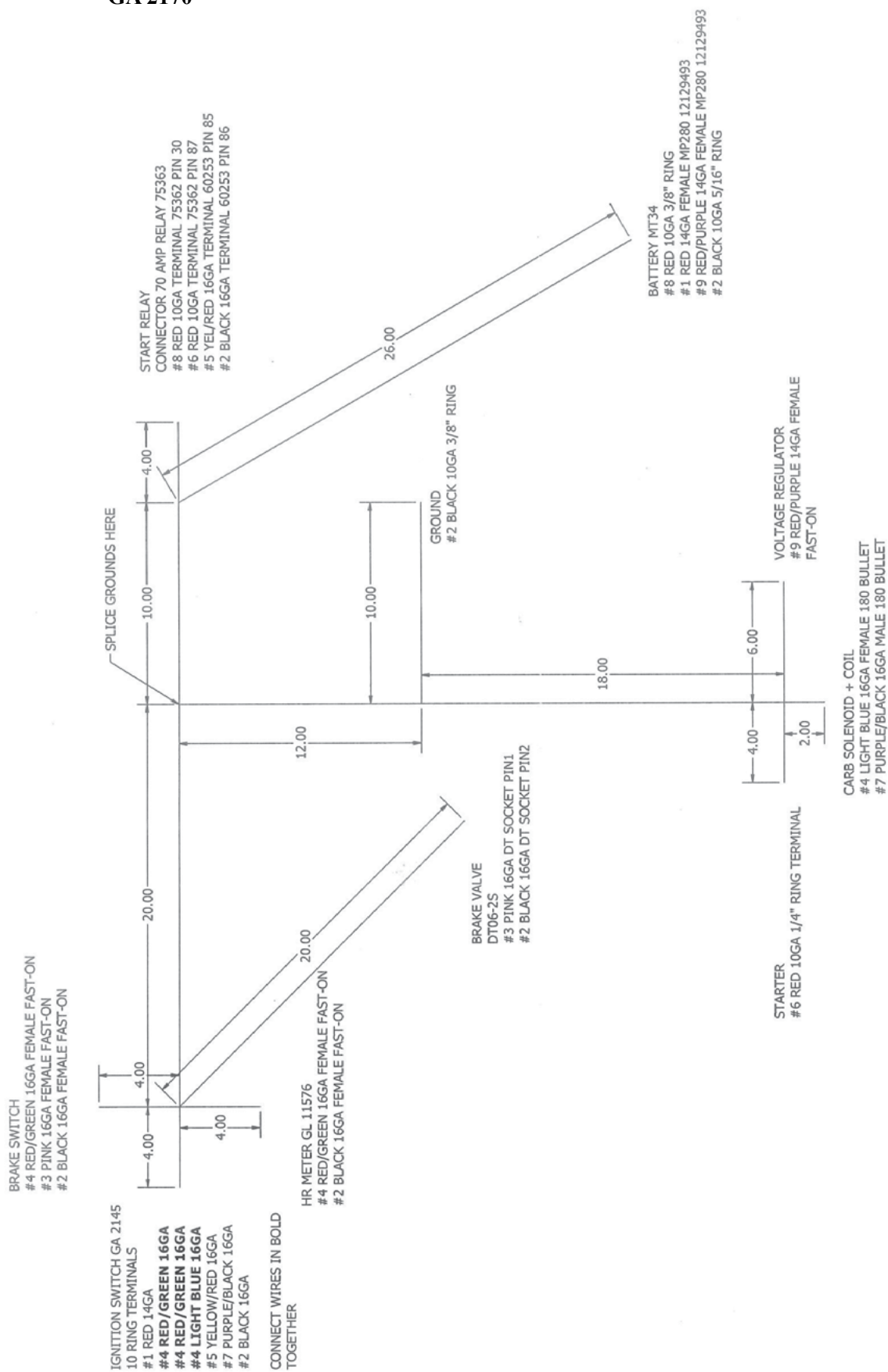




**ELECTRICAL****ELECTRICAL SCHEMATIC****GA 2170**

ELECTRICAL HARNESS DIAGRAM

GA 2170



**PARTS****GENERAL ENGINE PARTS**

GA 2150 Engine, 601CC horizontal, FH601D-FS01S

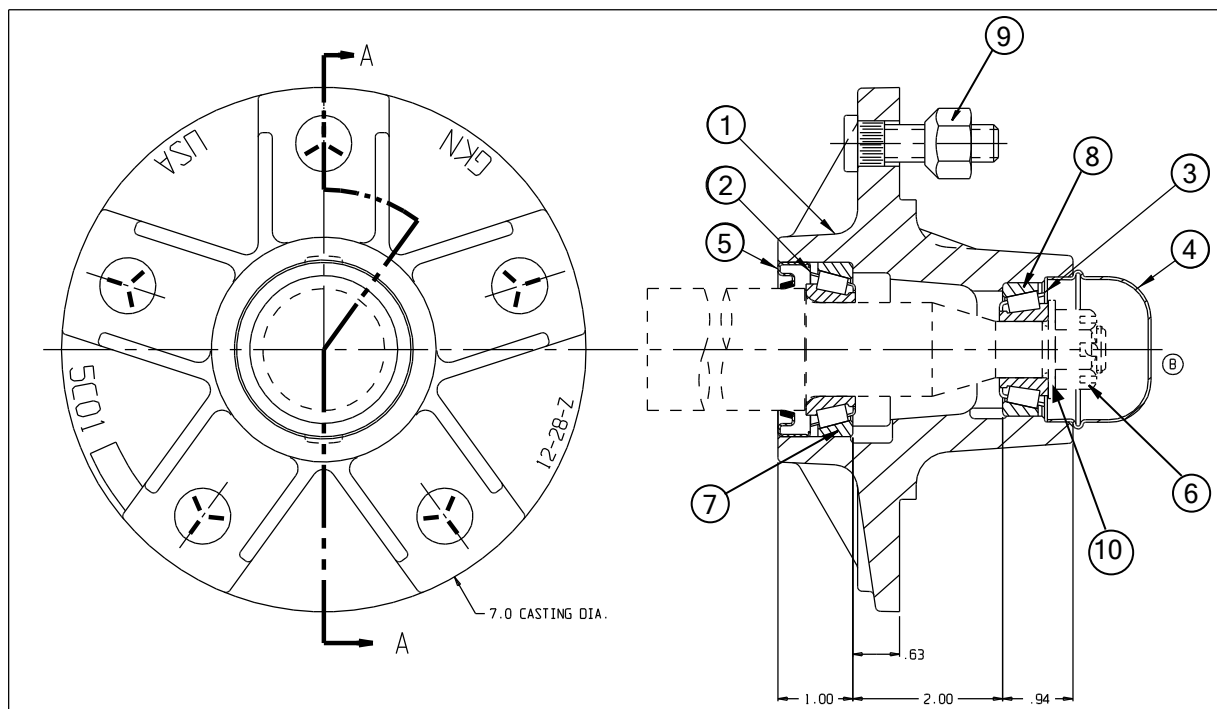
**FILTERS**

| <u>GVF Part Nos.</u> | <u>Description</u>   |
|----------------------|----------------------|
| KW 11013-7022        | FILTER, AIR PRIMARY  |
| KW 11013-7023        | FILTER, PREFILTER    |
| KW 49065-7010        | FILTER, OIL          |
| KW 49019-0027        | FILTER, FUEL         |
| KW 99969-6296        | OIL, 10W40 QT K-TECH |
| KW 92070-7004        | SPARK PLUG, BPR4ES   |

**KAWASAKI ENGINE PARTS**

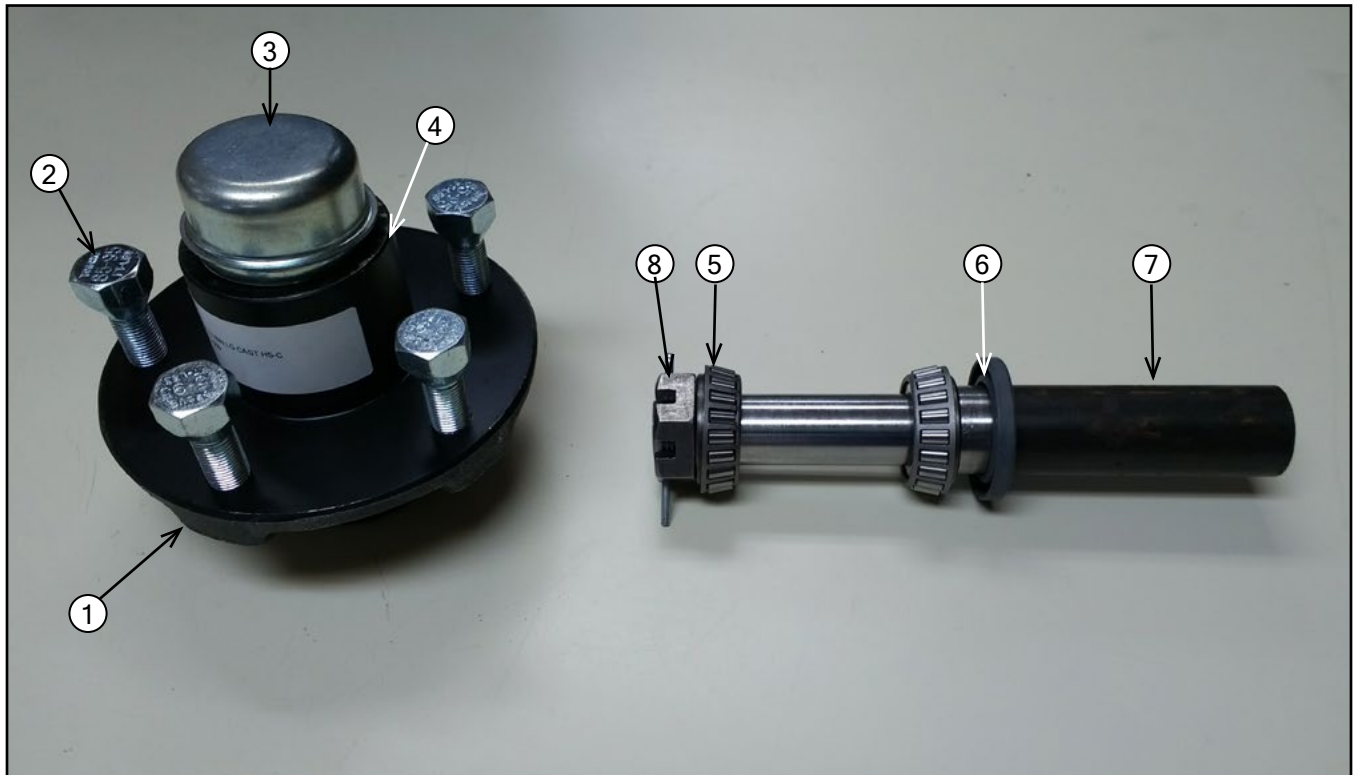
| <u>Kawasaki Part Nos:</u> | <u>Description:</u>     |
|---------------------------|-------------------------|
| 16115-7001                | CAP, OIL FILL           |
| 52005-7003                | OIL, DIPSTICK           |
| 92066-7003                | DRAIN PLUG              |
| 670D2016                  | ORING, DRAIN PLUG       |
| 92055-7004                | ORING, CAP OIL FILL     |
| 21171-7034                | COIL ASSY IGNITION      |
| 49040-7001                | FUEL PUMP               |
| 49070-7009                | MUFFLER COMP            |
| 11060-7022                | GASKET, MUFFLER         |
| 92210-7010                | NUT, AIR FILTER HOUSING |

## STEER HUB BREAKDOWN



| REF. NO. | PART NUMBER | DESCRIPTION            |
|----------|-------------|------------------------|
| 1.       | GO 11656    | HUB 5-5.5IN-4IN- 2000# |
| 2.       | GO 11754    | BEARING INNER          |
| 3.       | GO 11755    | BEARING OUTER          |
| 4.       | GO 11751    | DUST CAP               |
| 5.       | GO 11752    | SEAL                   |
| 6.       | MB 15183    | NUT, 5/8 SLT HEX NF    |
| 7.       | GO 11753    | BEARING INNER RACE     |
| 8.       | GO 11756    | BEARING OUTER RACE     |
| 9.       | GO 11646    | NUT, STUD              |
| 10.      | GH 11616    | FLAT WASHER, SAE 5/8   |

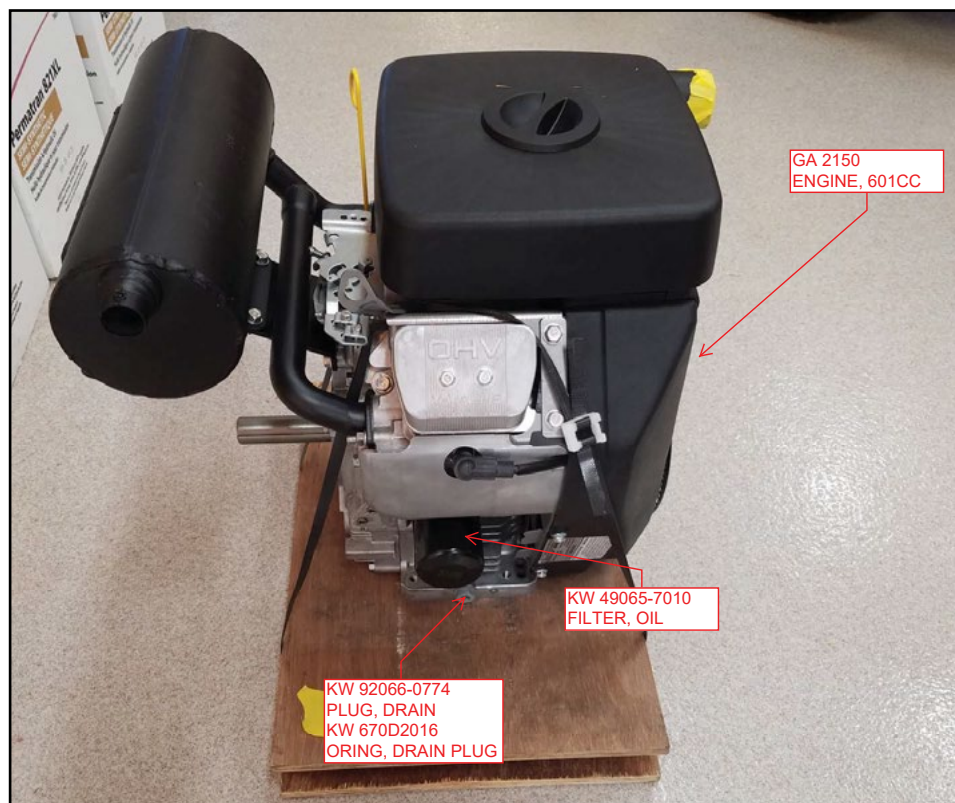
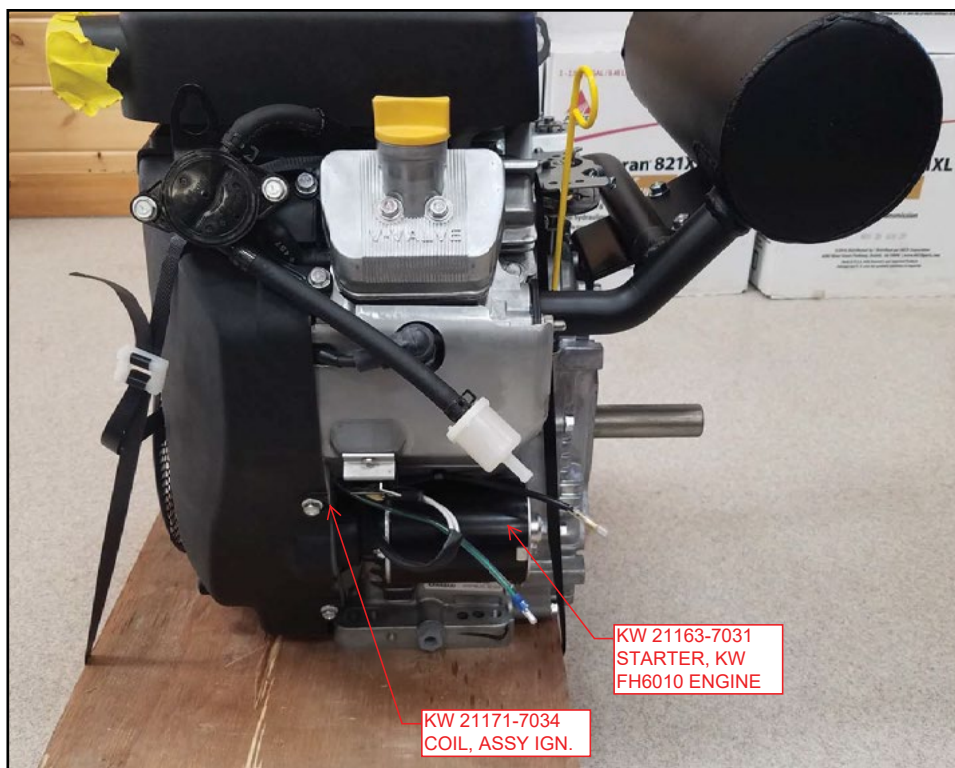
**NOTE: ITEM 1 INCLUDES ITEMS 2 THRU 9.**

**HUB BREAKDOWN****GO 11790****Hub 5 Stud 1IN HS X 4 1/8IN LG Cast H5-C**

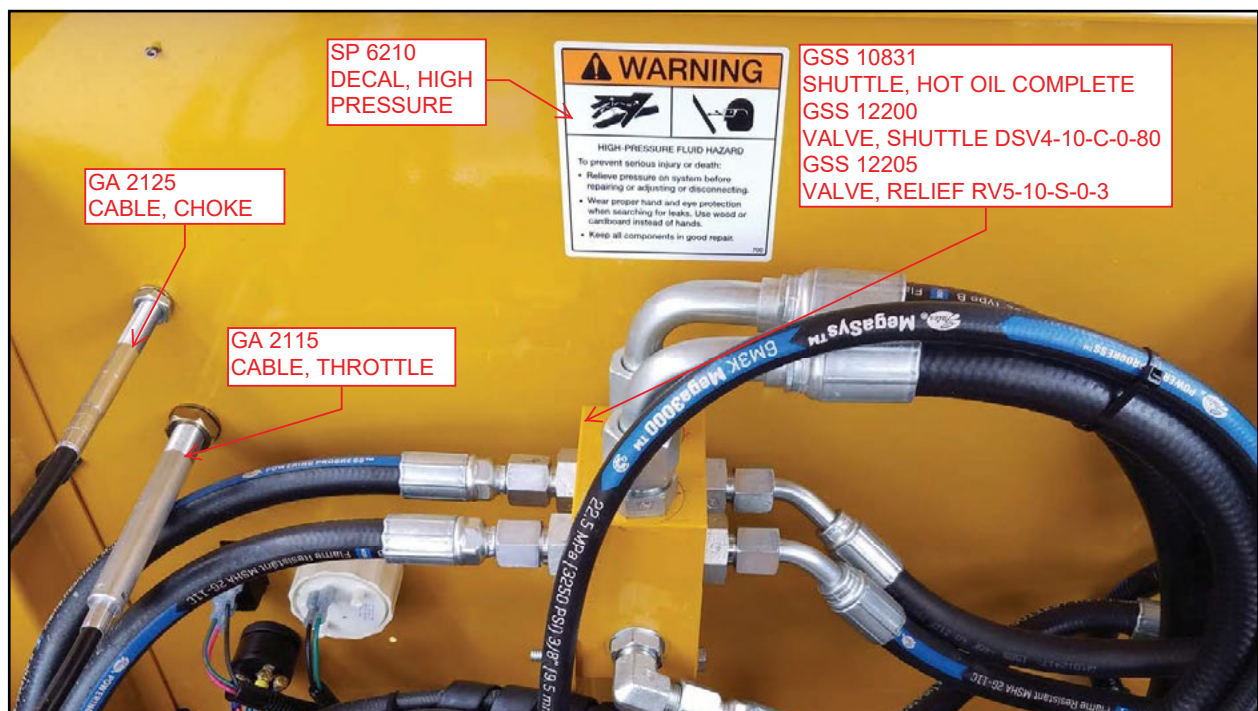
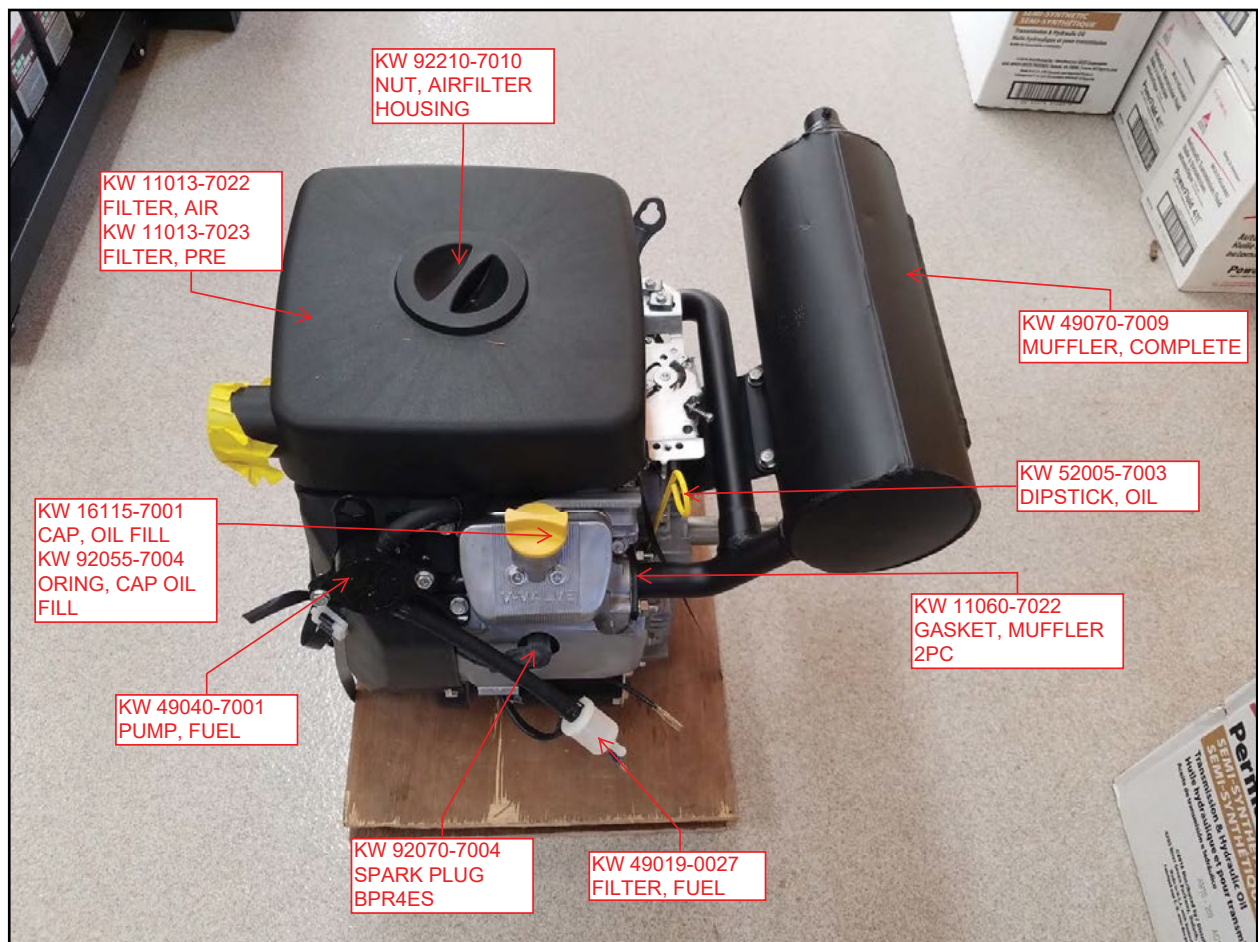
| REF. NO. | PART NUMBER  | DESCRIPTION                              |
|----------|--------------|--|
| 1.       | GO 11790     | HUB 5 STUD 1IN HS X 4 1/8IN LG CAST H5-C |
| 2.       | GO 11415     | BOLT, WHEEL #610-018 - 1/2-20 X 1 1/2    |
| 3.       | GO 11210     | DUST CAP GC-1 FOR HUB H5-C               |
| 4.       | MF 832190M1  | BEARING CUP L44610                       |
| 5.       | MF 70341230  | BEARING CONE L44643                      |
| 6.       | GCST ST-0182 | SEAL, HUB CR12437                        |
| 7.       | GO 11789     | SPINDLE, 1IN W/NUT & COTTER PIN SA-1     |
| 8.       | GSS 10435    | NUT, AXLE 1IN 615-009                    |

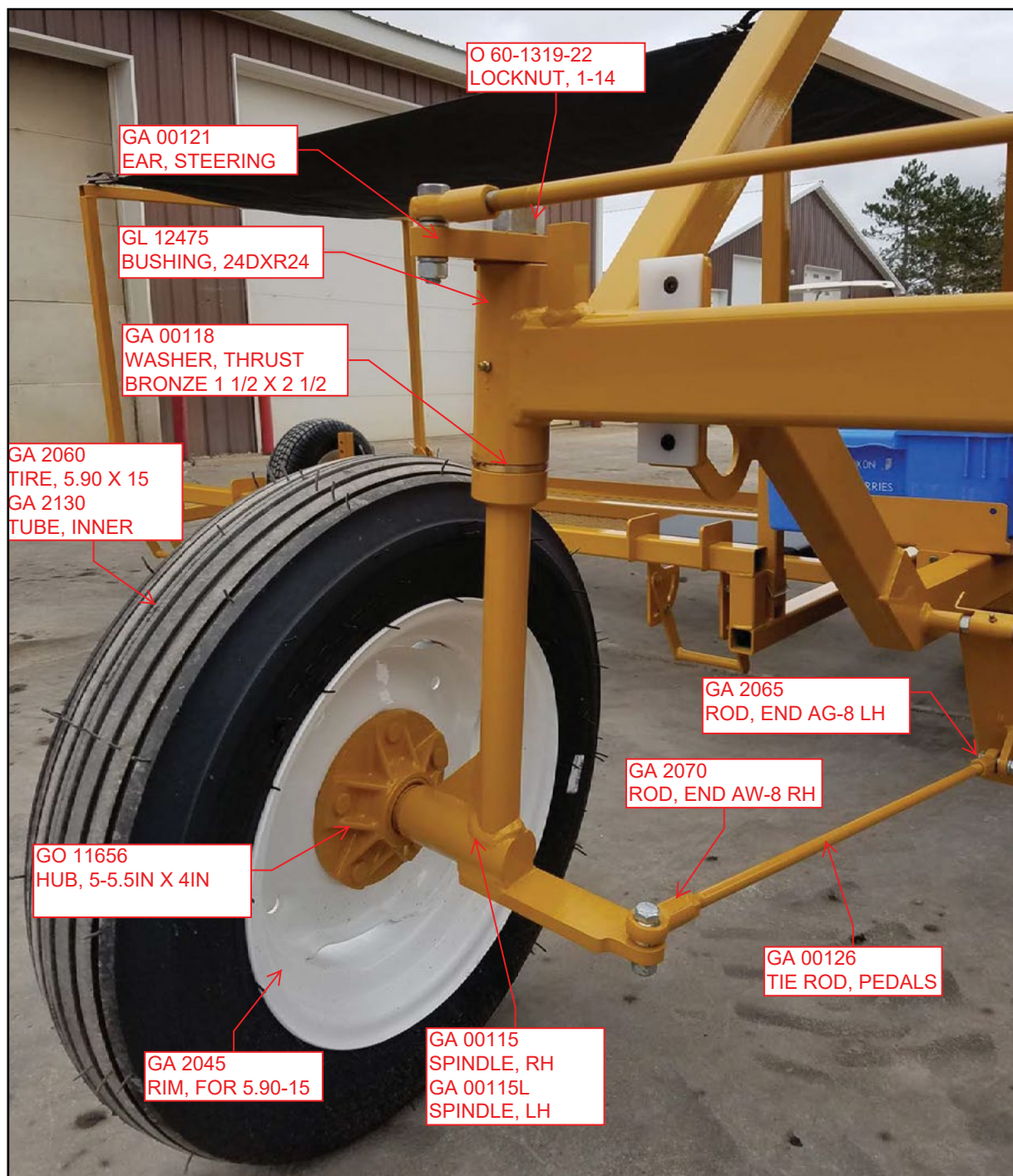
**NOTE: ITEM 1 INCLUDES ITEMS 2 THRU 6. ITEM 7 INCLUDES ITEM 8.**

## GENERAL PARTS

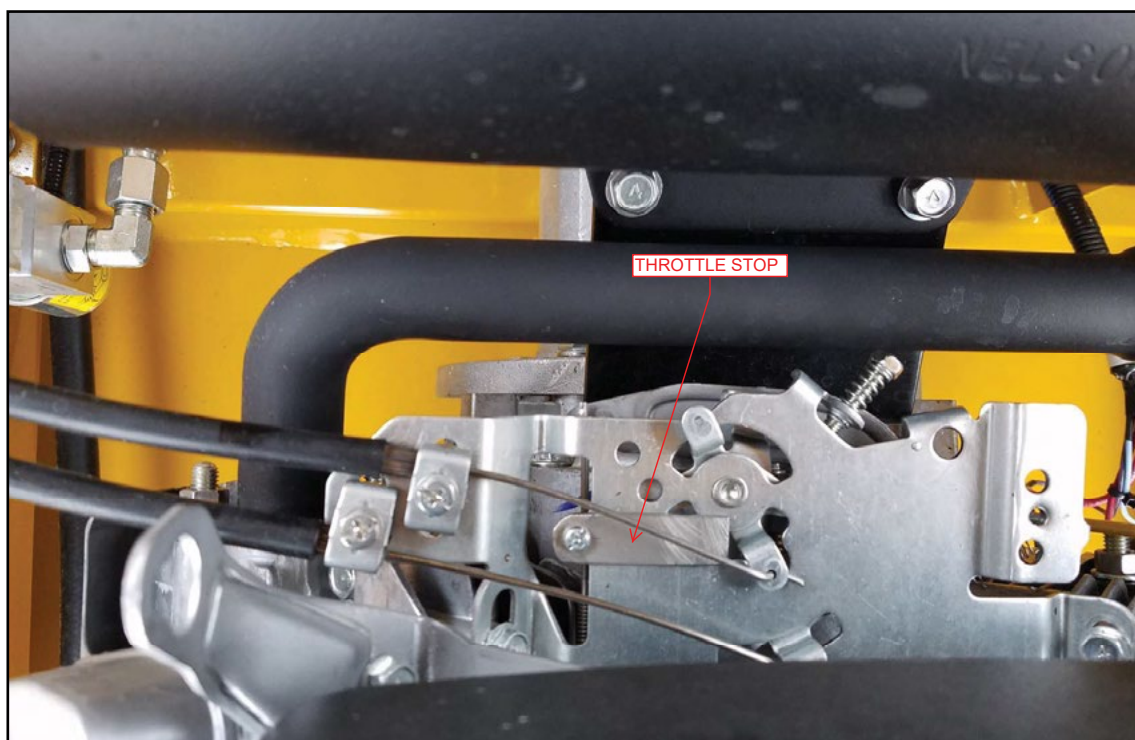
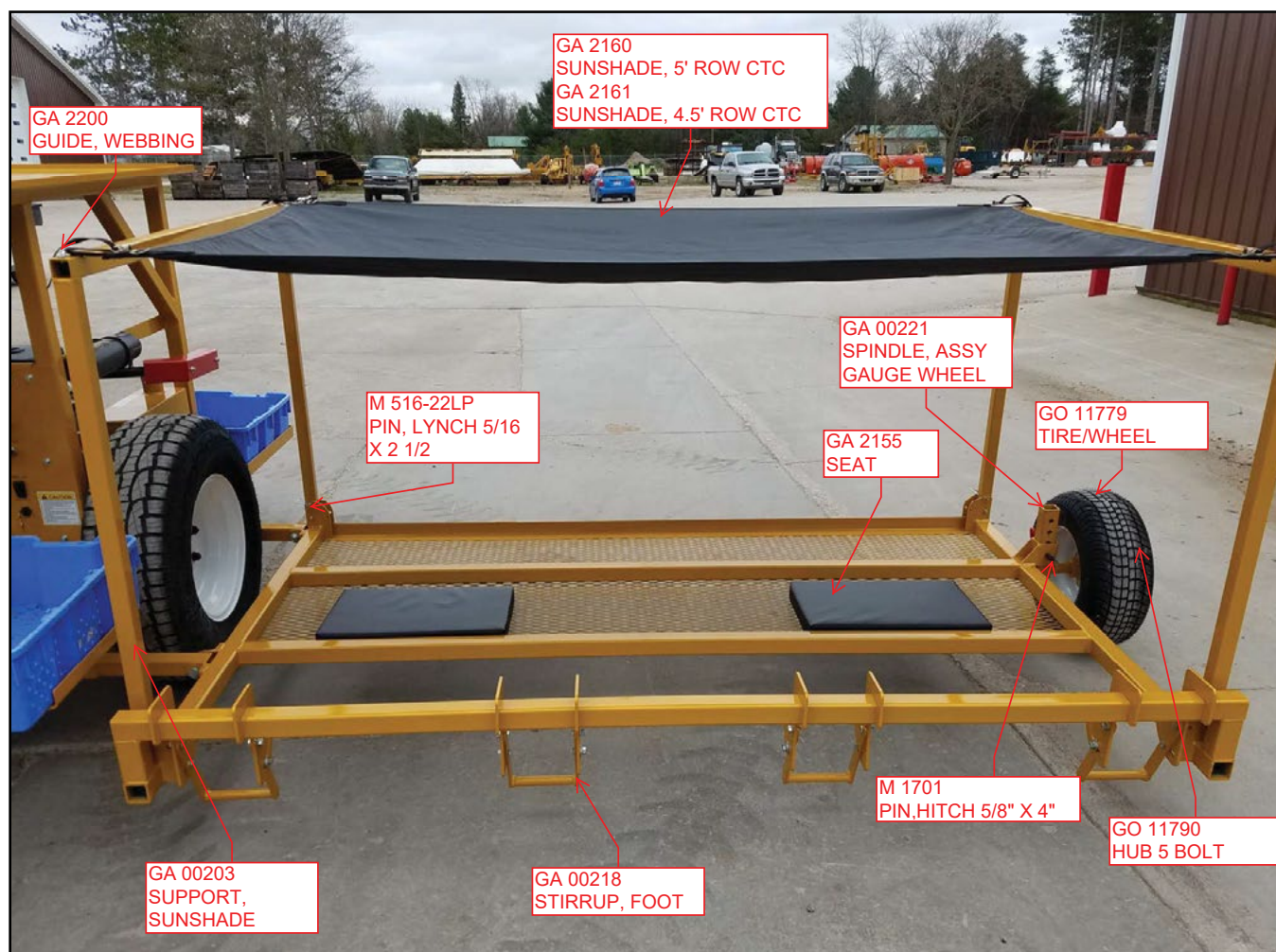


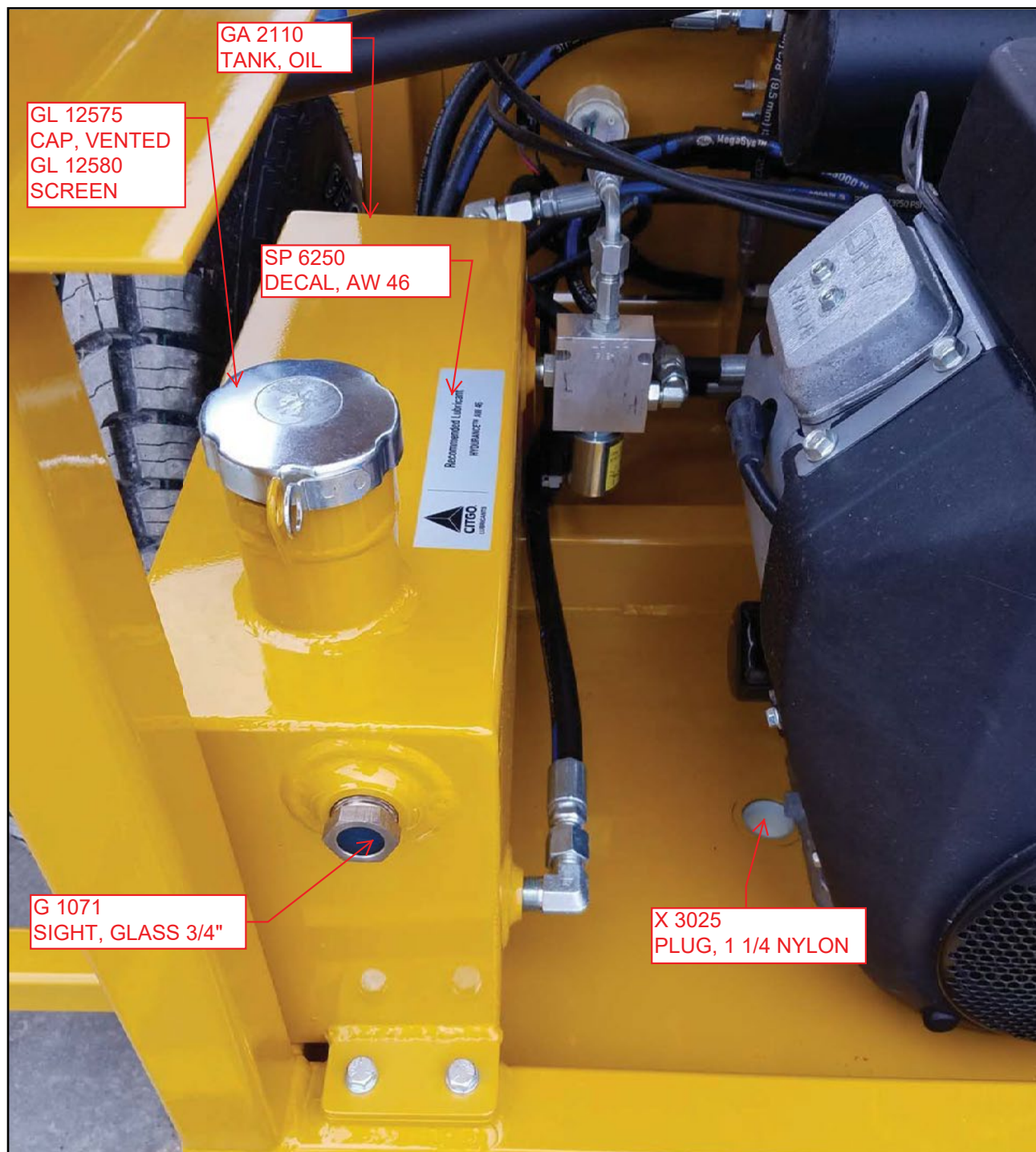




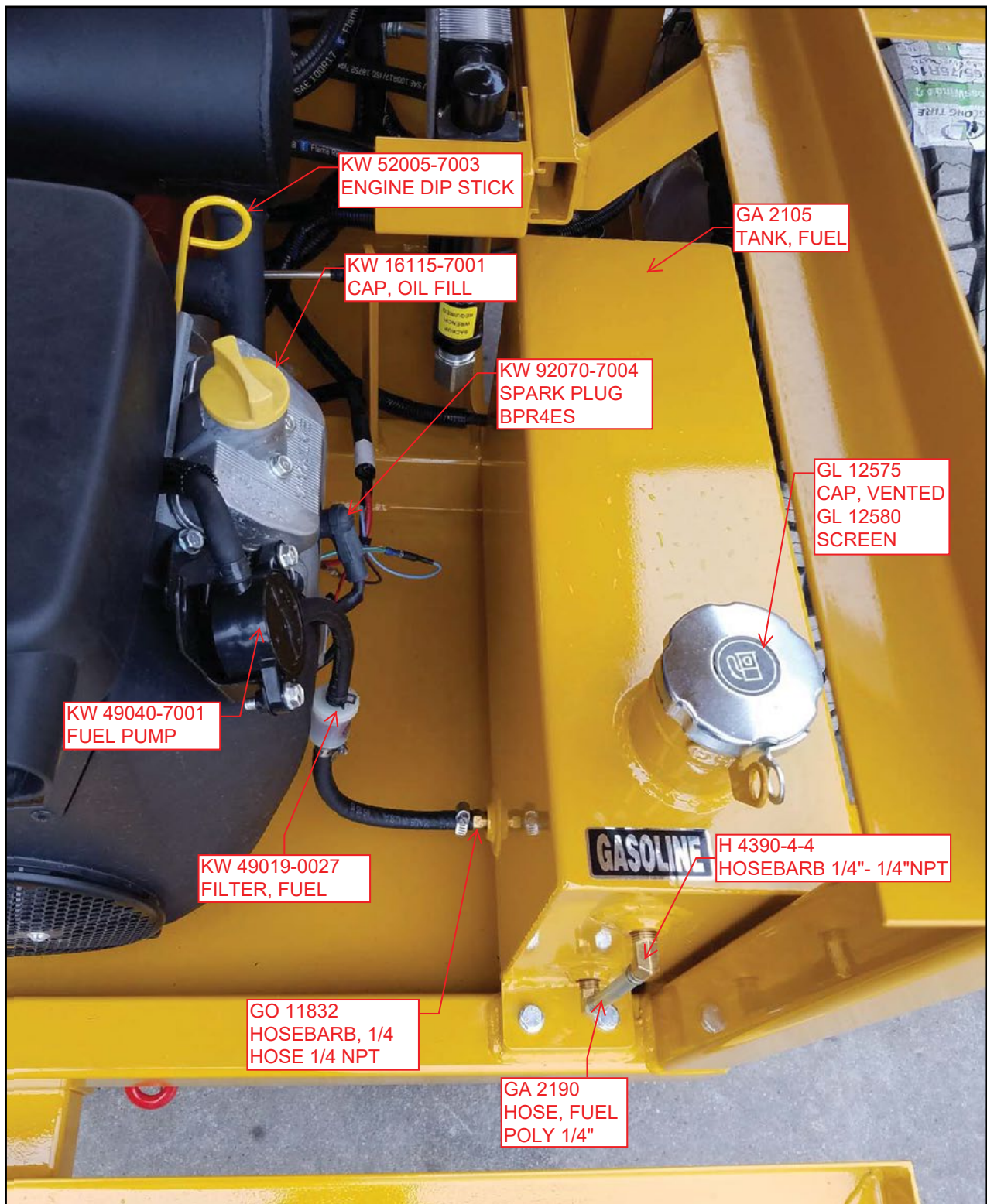


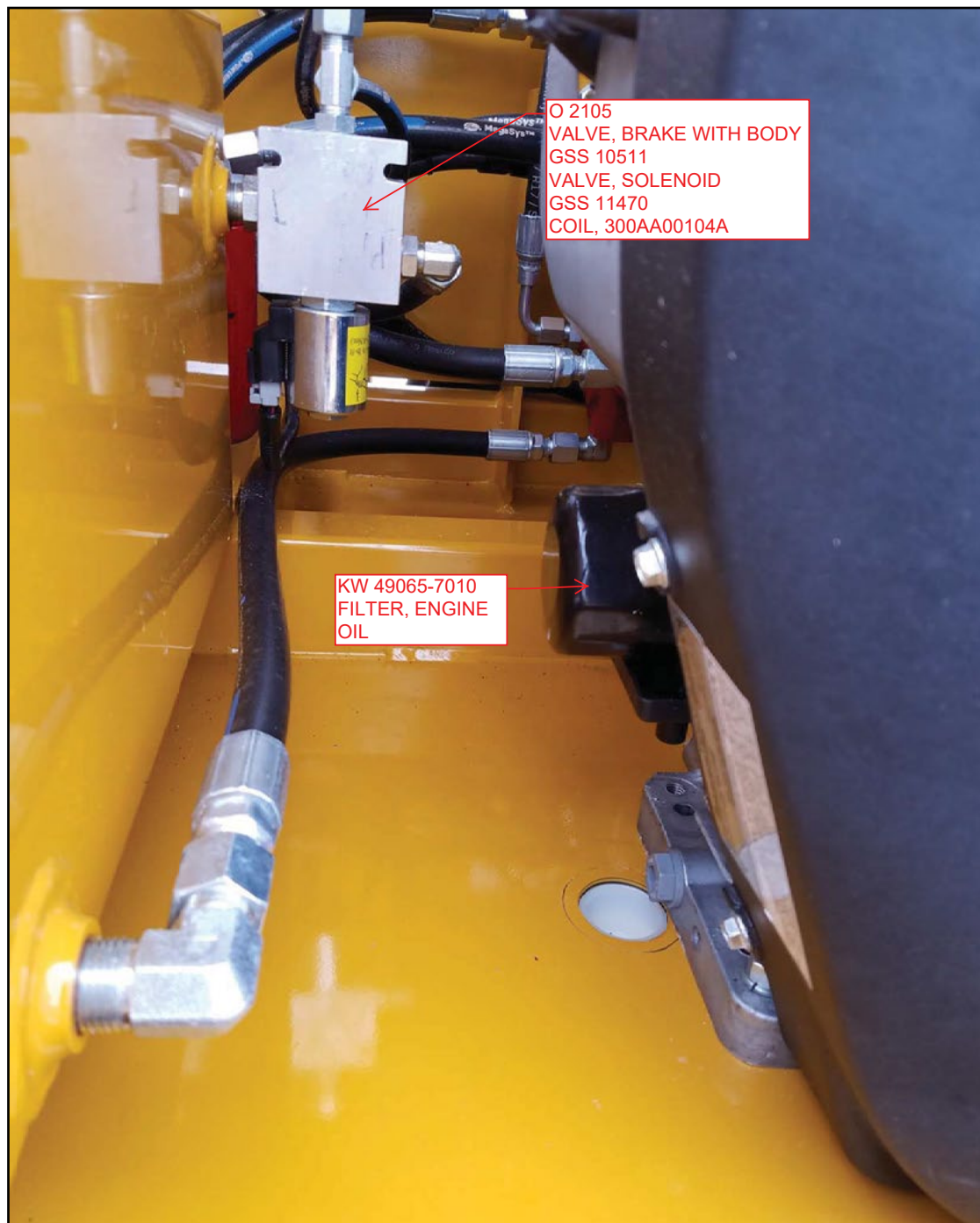




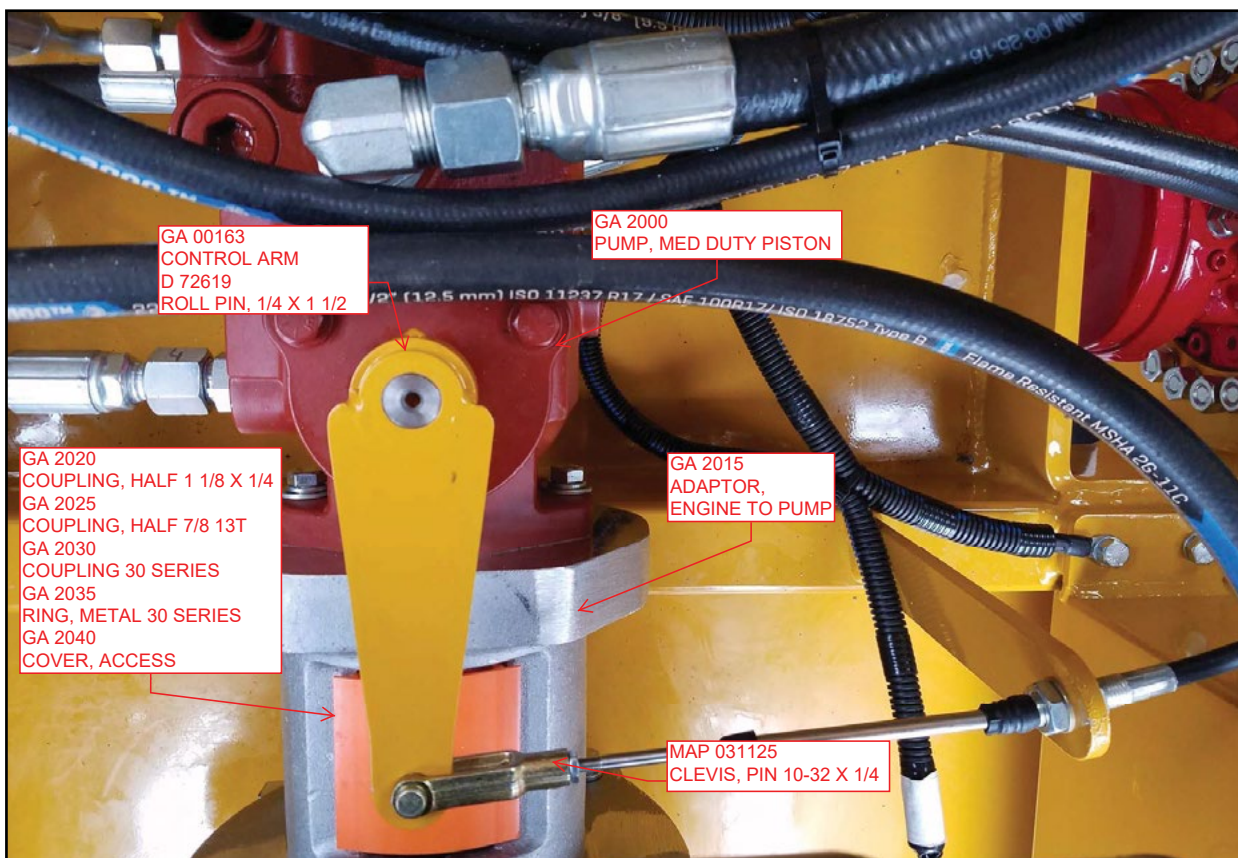




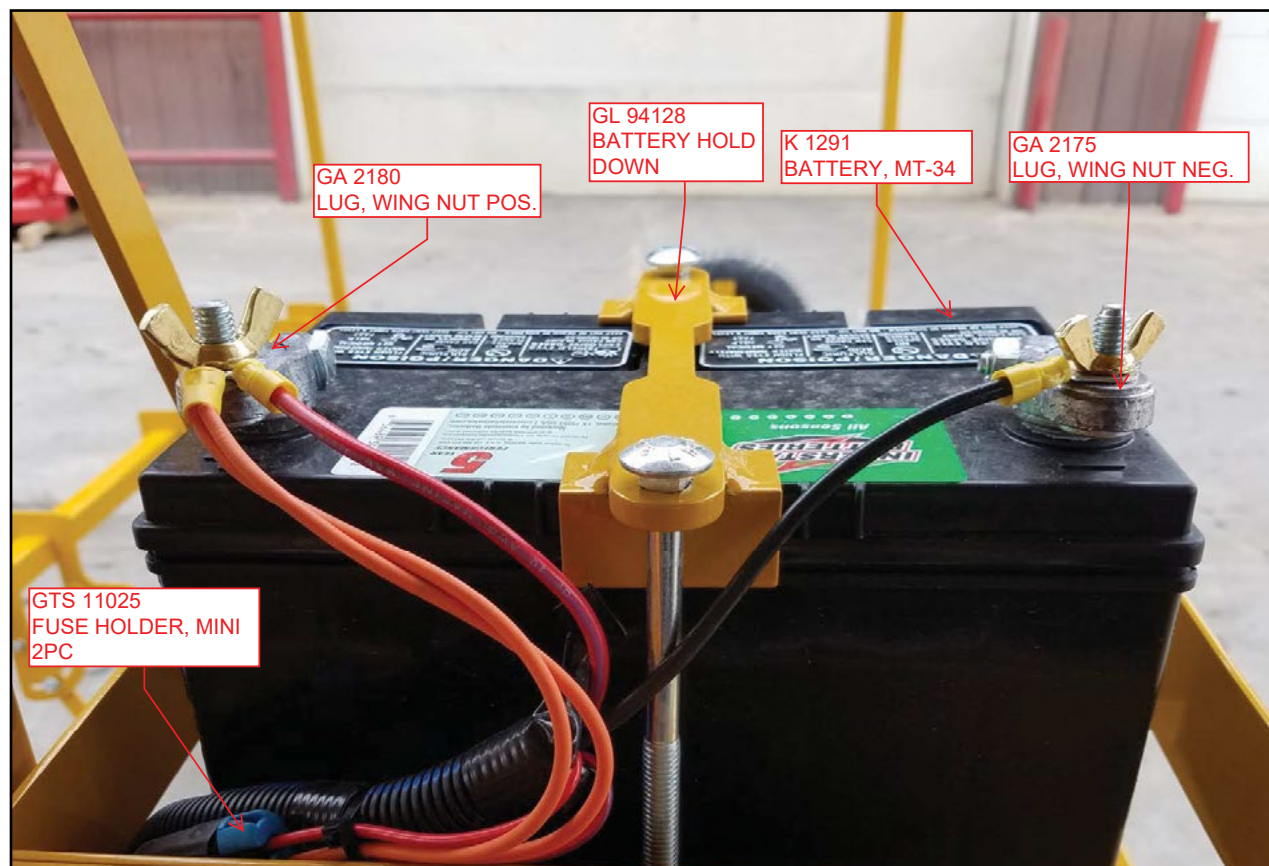
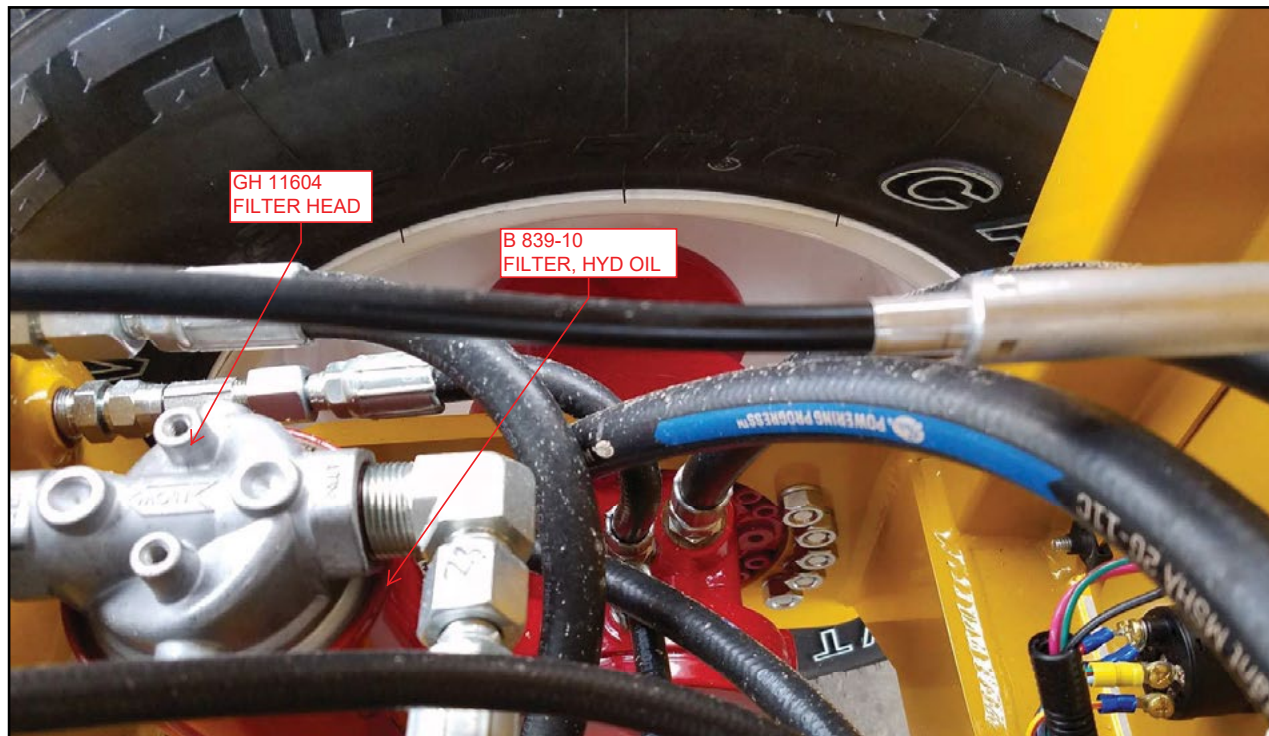


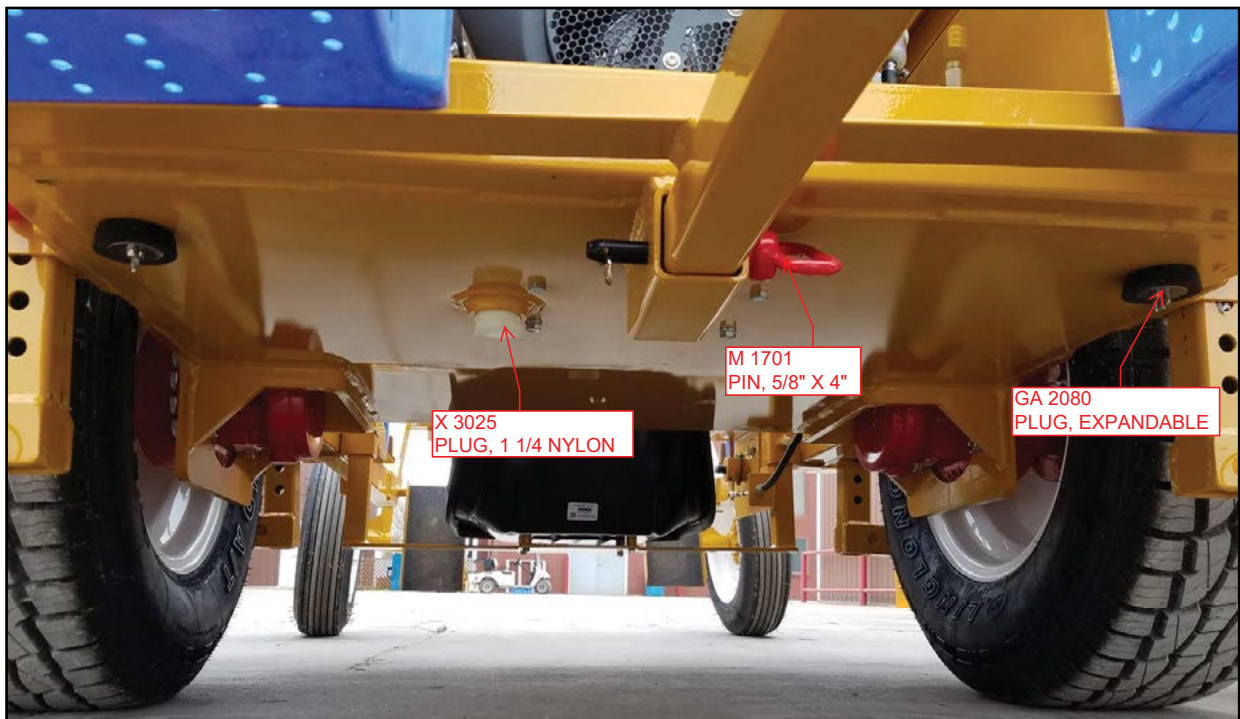




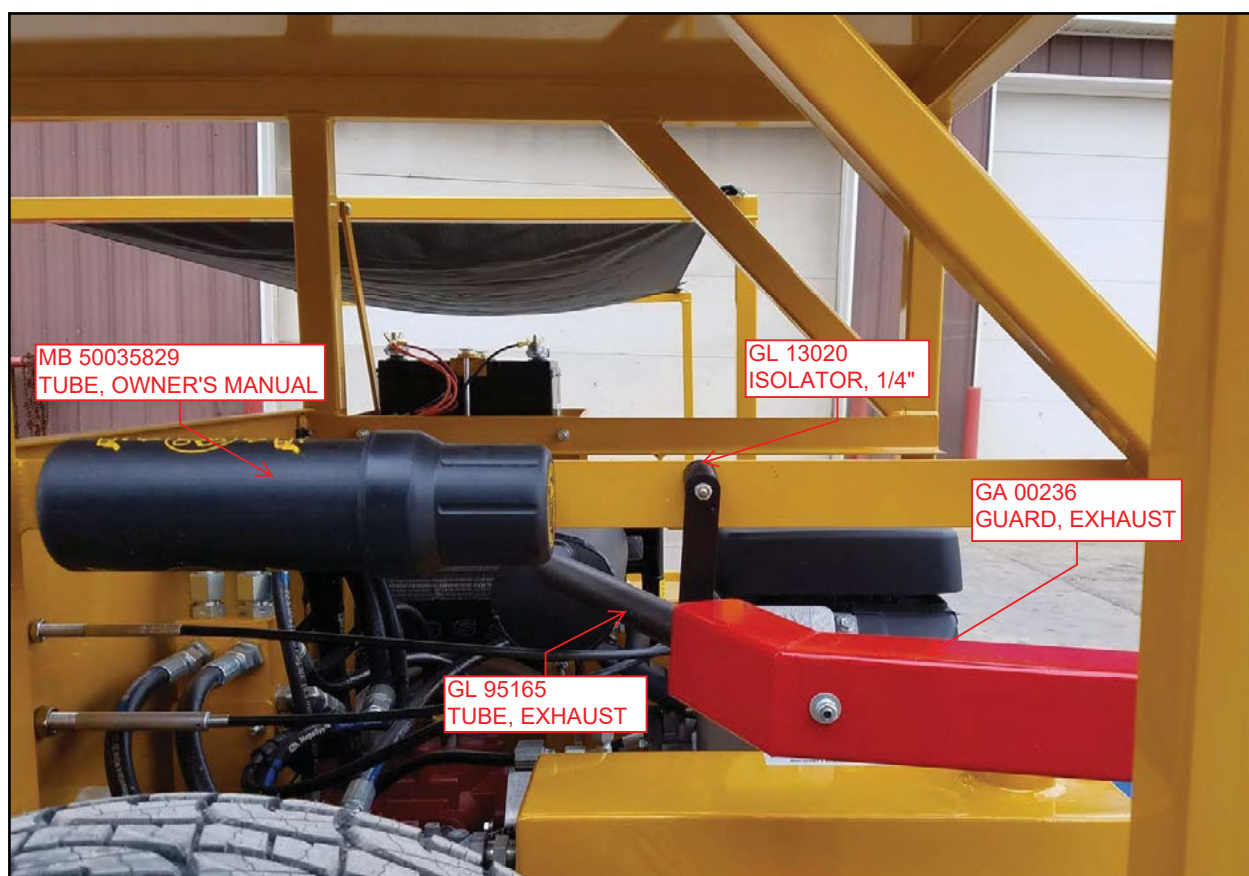
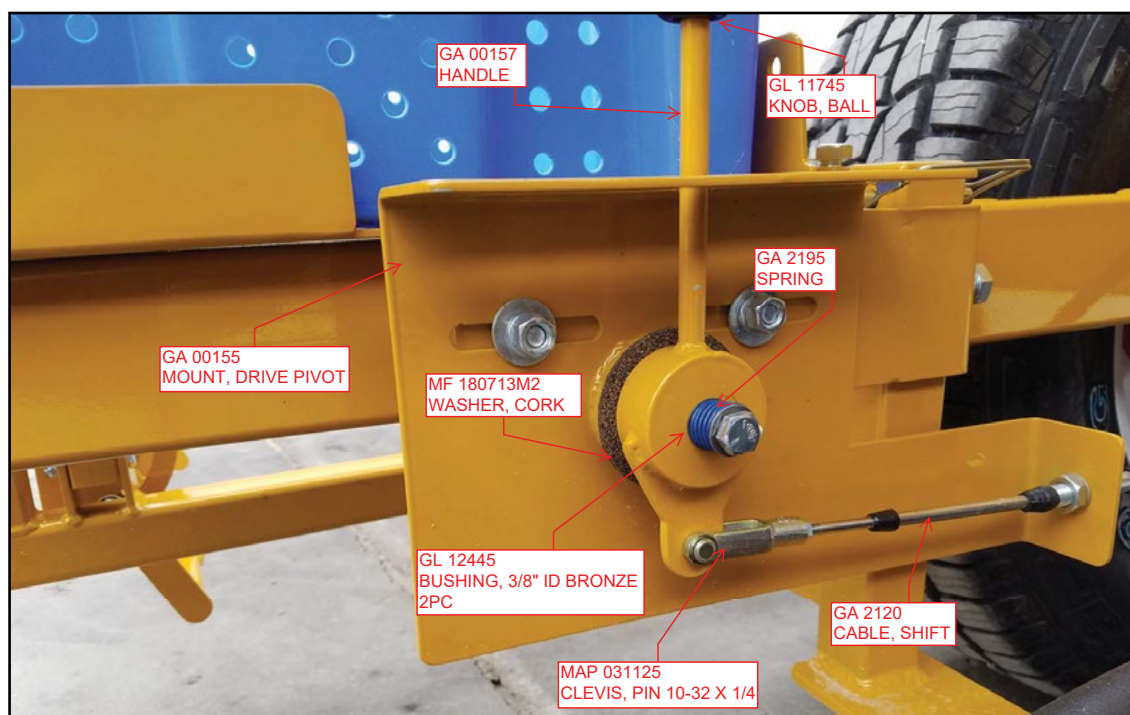






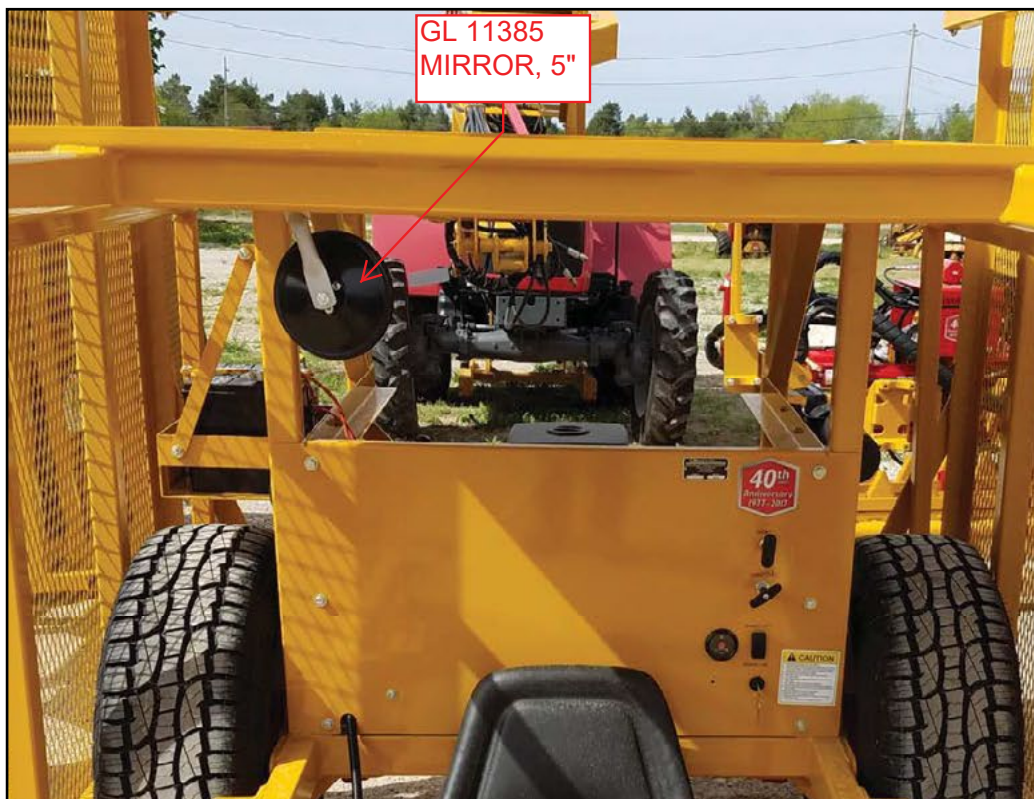
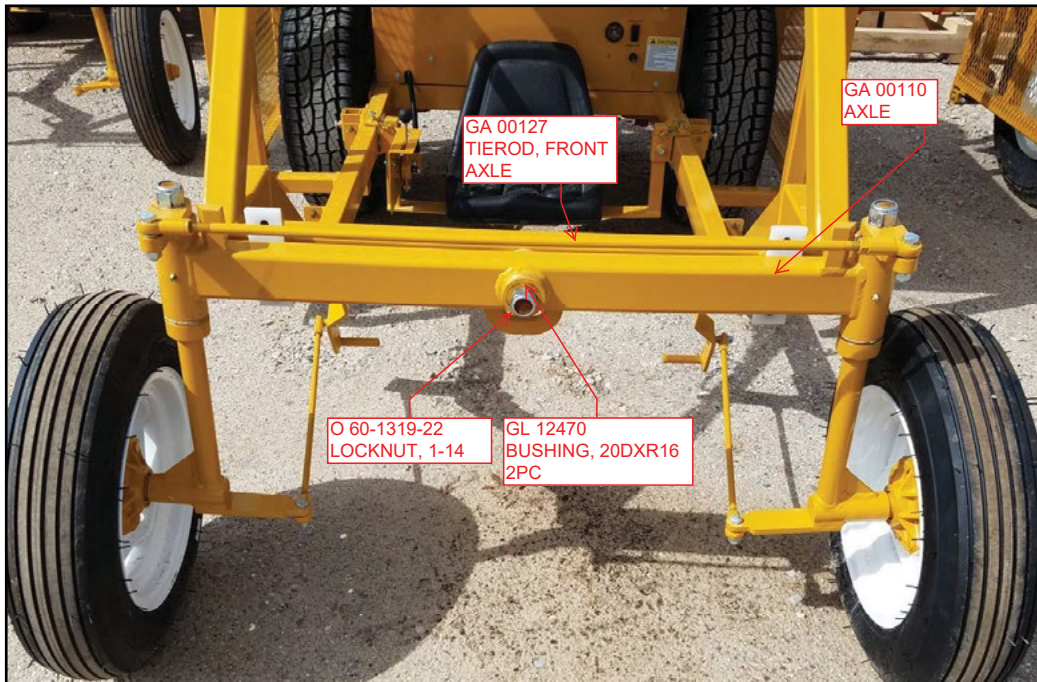




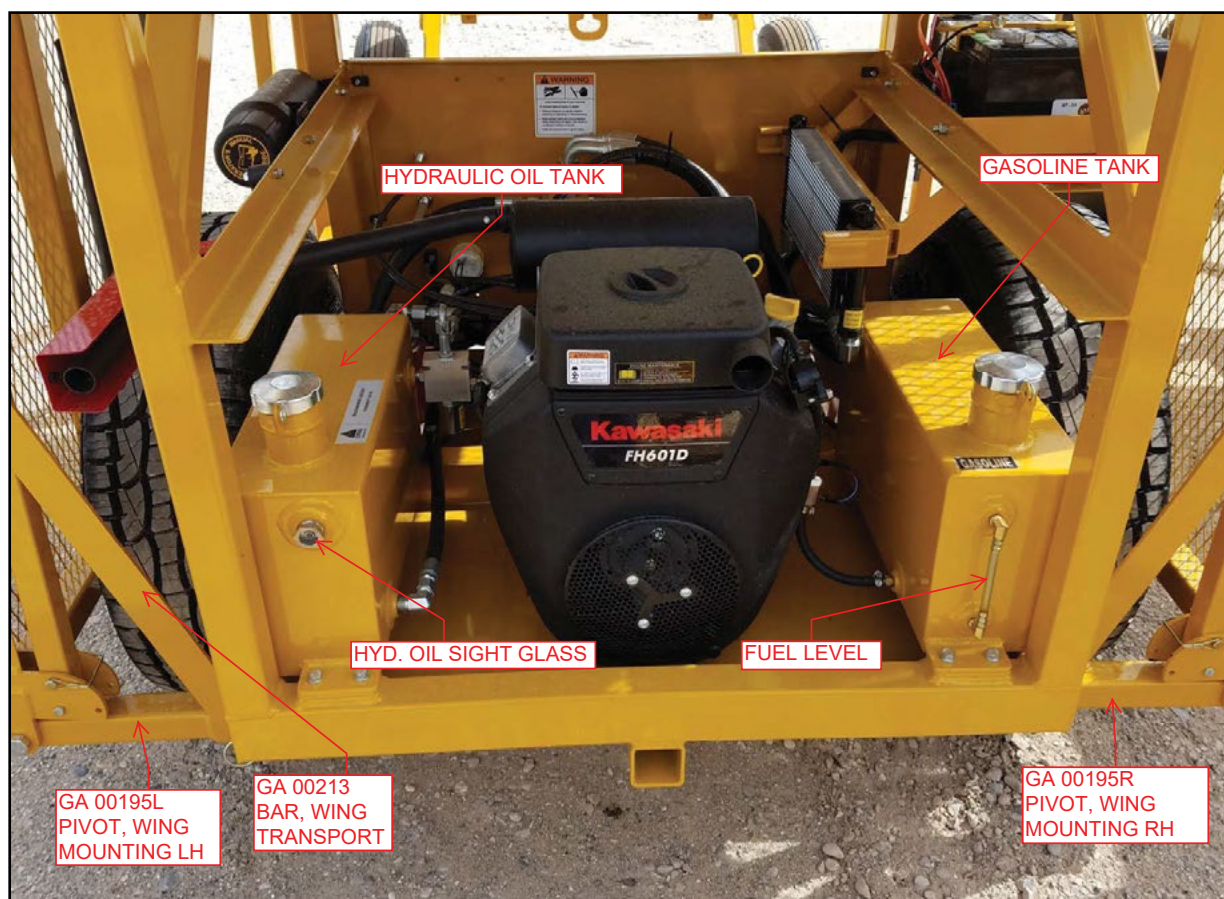








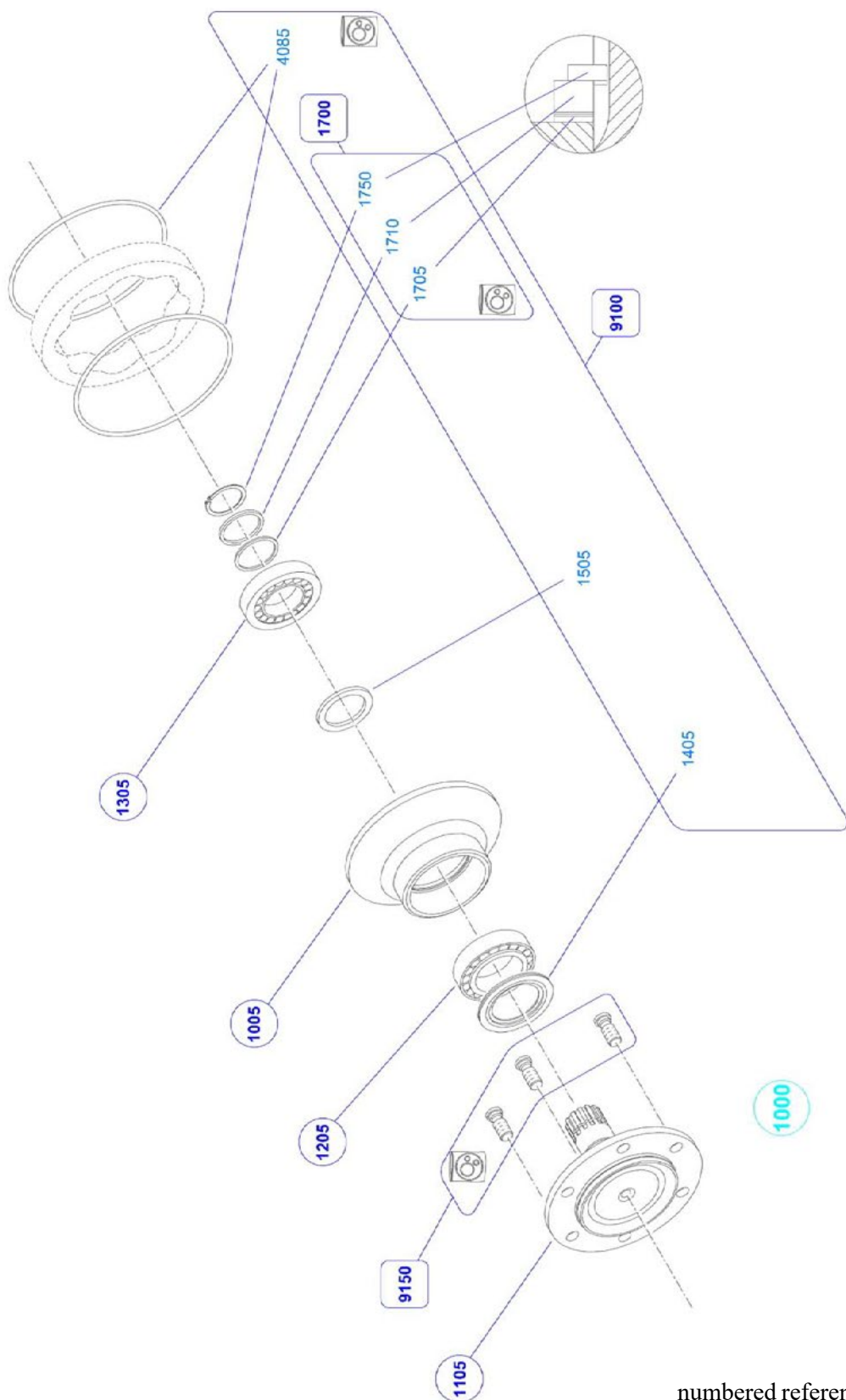




## WHEEL MOTOR BREAKDOWN

GA 2005

Motor, MS02-2-12A-F03-1120-YDGO 15.6 IN Wheel

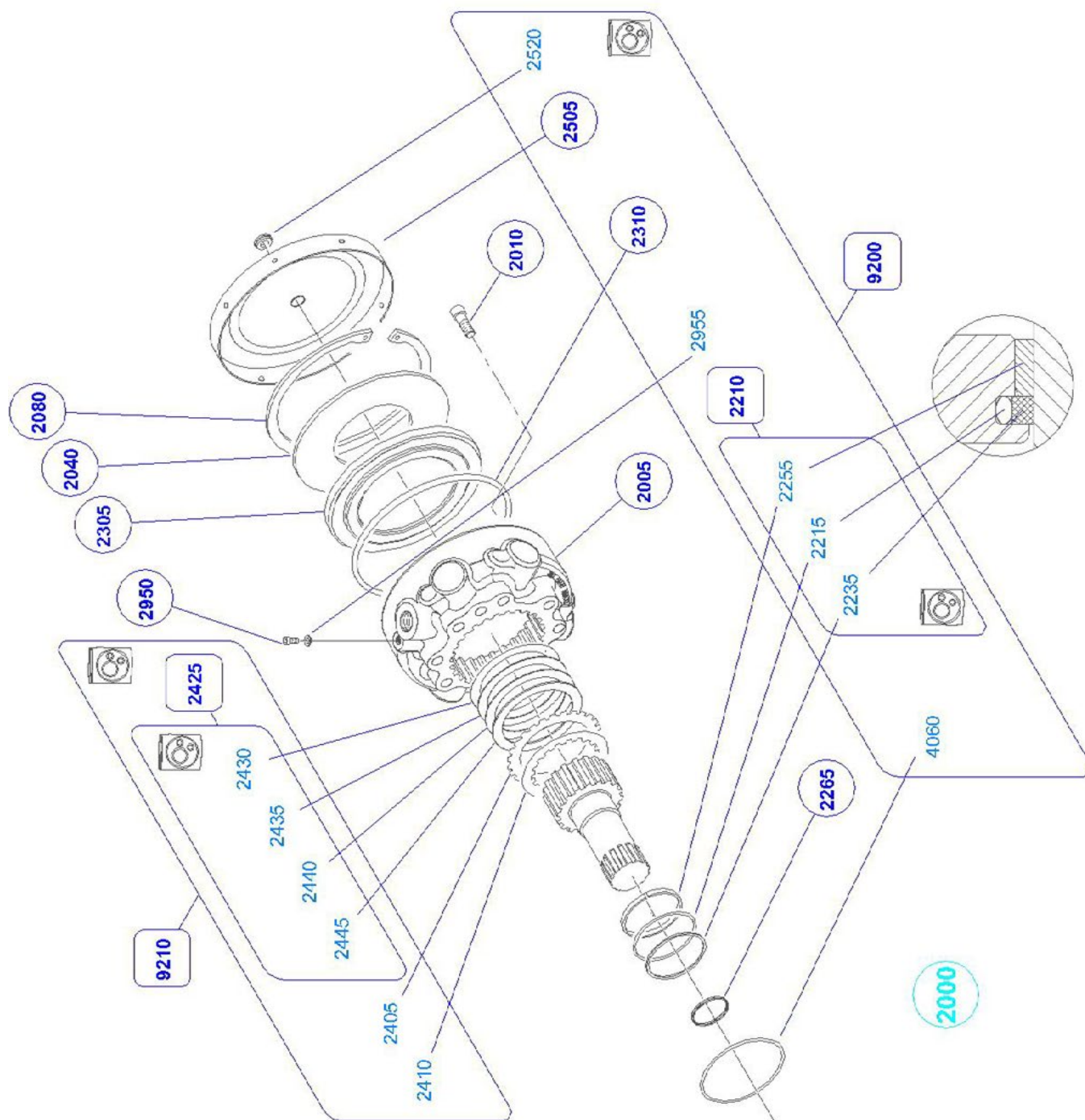


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| Level | Item | Description              | Reference | Qty |
|-------|------|--------------------------|-----------|-----|
| 0     |      | MS02-2-12A-F03-1120-Y8JM | A31793H   | 1   |
| 1     | 1000 | Other SUBASSEMBLY        | A14574R   | 1   |
| 2     | 1005 | BEARING SUPPORT          | A16892L   | 1   |
| 2     | 1105 | SHAFT                    | A20690P   | 1   |
| 2     | 1205 | BEARING                  | A07547D   | 1   |
| 2     | 1305 | BEARING                  | A05291B   | 1   |
| 2     | 9100 | REPAIR KIT               | A36607Q   | 1   |
| 3     | 1405 | SEAL                     | A20461Q   | 1   |
| 3     | 1505 | SEAL                     | A14952C   | 1   |
| 3     | 1700 | REPAIR KIT               | A17252C   | 1   |
| 4     | 1705 | SHIM                     |           | 1   |
| 5     | 1720 | SHIM                     |           | 1   |
| 5     | 1725 | SHIM                     |           | 1   |
| 5     | 1730 | SHIM                     |           | 1   |
| 5     | 1735 | SHIM                     |           | 1   |
| 5     | 1740 | SHIM                     |           | 1   |
| 4     | 1710 | GUIDE RING               |           | 1   |
| 4     | 1750 | SNAP RING                |           | 1   |
| 3     | 4085 | SEAL                     |           | 2   |
| 2     | 9155 | BOLT                     | B29492F   | 1   |
| 3     | 1010 | BOLT                     |           | 5   |



## Wheel Motor Breakdown, GA 2005 continued

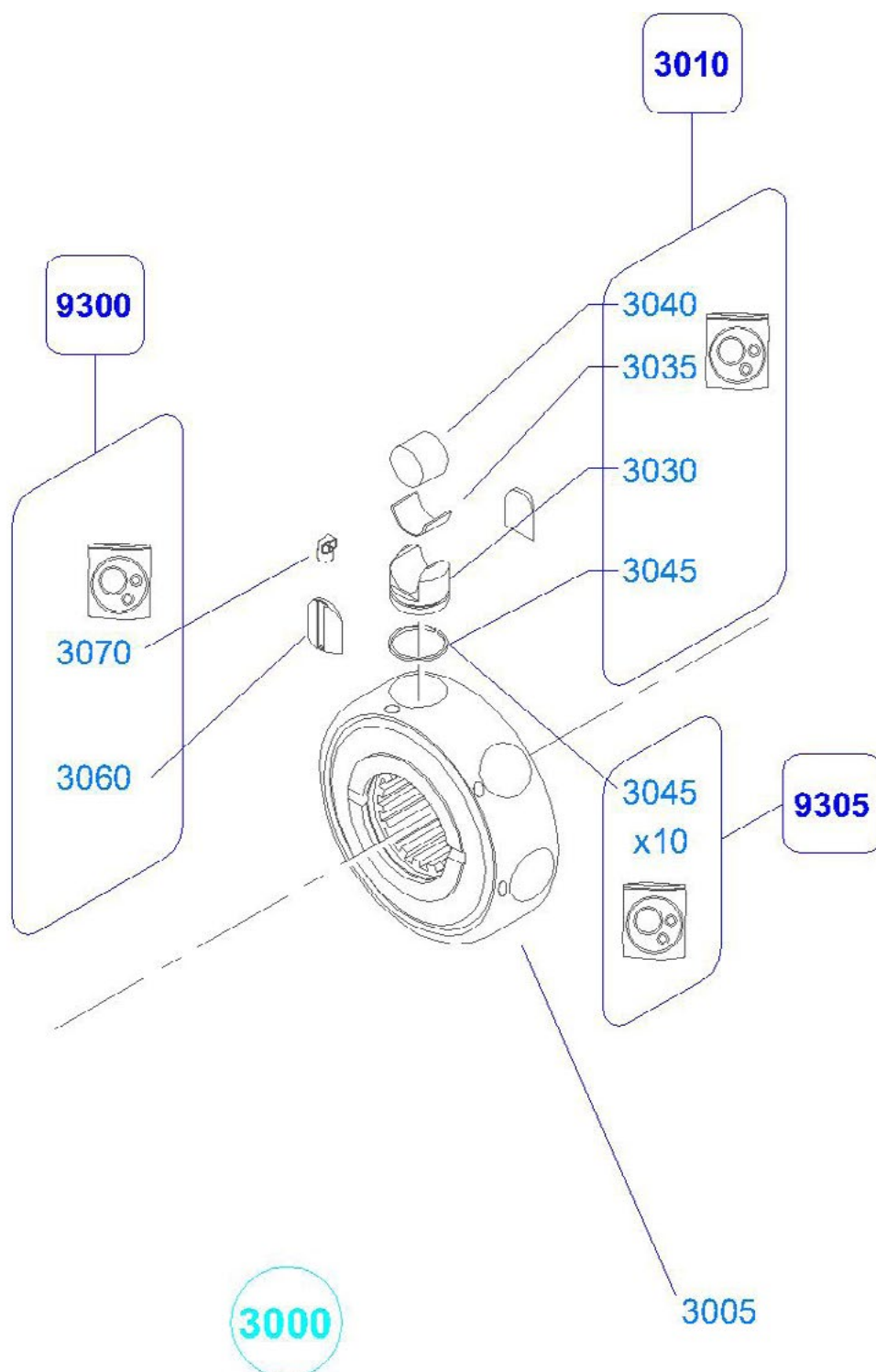


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| Level | Item | Description       | Reference  | Qty |
|-------|------|-------------------|------------|-----|
| 1     | 2000 | BRAKE SUBASSEMBLY | A25796P    | 1   |
| 2     | 2005 | BRAKE HOUSING     | A25677K    | 1   |
| 2     | 2010 | SCREW             | 001332944C | 10  |
| 2     | 2040 | WASHER            | 000834924B | 1   |
| 2     | 2080 | SNAP RING         | 000036272B | 1   |
| 2     | 2205 | BRAKE SHAFT       | A18580V    | 1   |
| 2     | 2305 | BRAKE PISTON      | A21623D    | 1   |
| 2     | 2950 | SCREW             | 000932912K | 1   |
| 2     | 9200 | REPAIR KIT        | A36744P    | 1   |
| 3     | 2210 | SEAL              | 005337750C | 1   |
| 4     | 2215 | SEAL              |            | 1   |
| 4     | 2235 | SEAL SUPPORT      |            | 1   |
| 4     | 2255 | OTHER BUSHING     |            | 1   |
| 3     | 2505 | SHIELD            | A20860Z    | 1   |
| 3     | 2955 | SEAL              | 001446072S | 1   |
| 3     | 4060 | SEAL              |            | 1   |
| 3     | 9225 | SEAL KIT          | A36741L    | 1   |
| 4     | 2310 | SEAL              |            | 1   |
| 4     | 2520 | PLUG              |            | 1   |
| 2     | 9210 | REPAIR KIT        | 005949649K | 1   |
| 3     | 2405 | BRAKE DISC        |            | 21  |
| 3     | 2410 | BRAKE DISC        |            | 20  |
| 3     | 2425 | SHIM              | 003245372D | 1   |
| 4     | 2430 | SHIM              |            | 2   |
| 4     | 2435 | SHIM              |            | 1   |
| 4     | 2440 | SHIM              |            | 2   |
| 4     | 2445 | SHIM              |            | 1   |



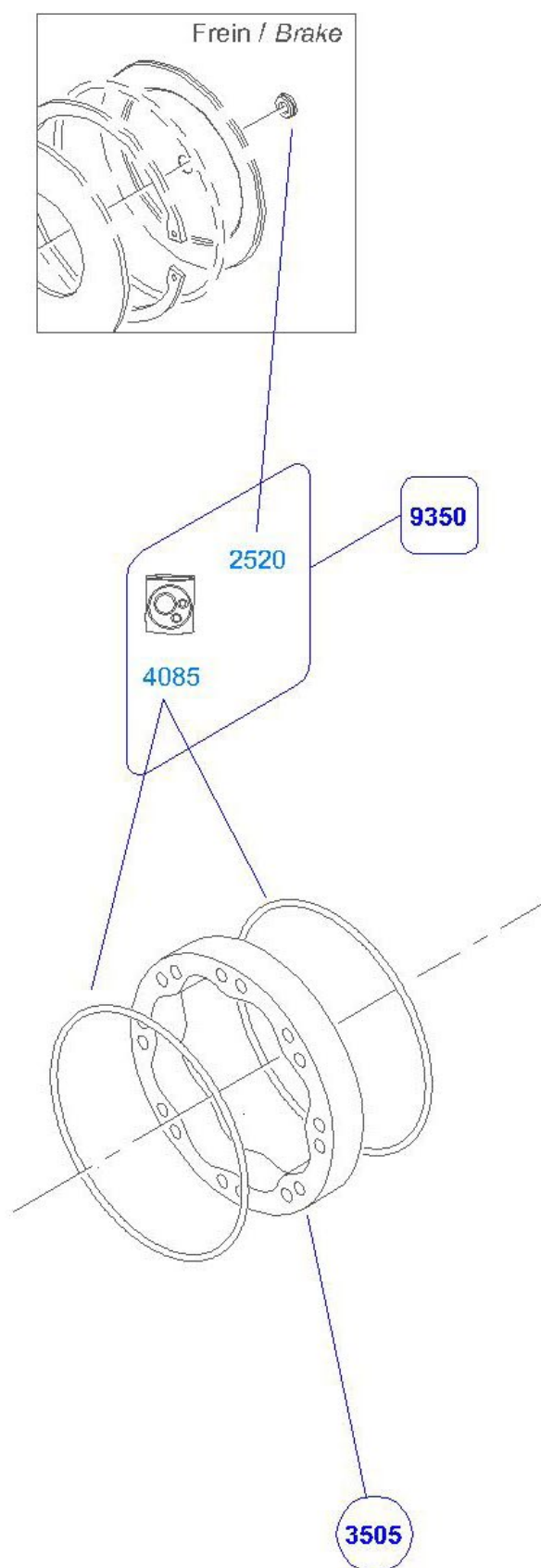
## Wheel Motor Breakdown, GA 2005 continued



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| Level | Item | Description    | Reference | Qty |
|-------|------|----------------|-----------|-----|
| 1     | 3000 | CYLINDER BLOCK | A19174R   | 1   |
| 2     | 3005 | CYLINDER BLOCK |           | 1   |
| 2     | 3010 | RADIAL PISTON  | A36708A   | 8   |
| 3     | 3030 | RADIAL PISTON  |           | 1   |
| 3     | 3035 | PISTON BUSHING |           | 1   |
| 3     | 3040 | ROLLER         |           | 1   |
| 3     | 3045 | SEAL           |           | 1   |
| 2     | 9300 | REPAIR KIT     | A36714G   | 1   |
| 3     | 3060 | LUNAMBULE      |           | 16  |
| 3     | 3070 | CLIP           |           | 8   |
| 3     | 3070 | CLIP           |           | 8   |
| 2     | 9305 | SEAL KIT       | A44475S   | 1   |
| 3     | 3045 | SEAL           |           | 10  |

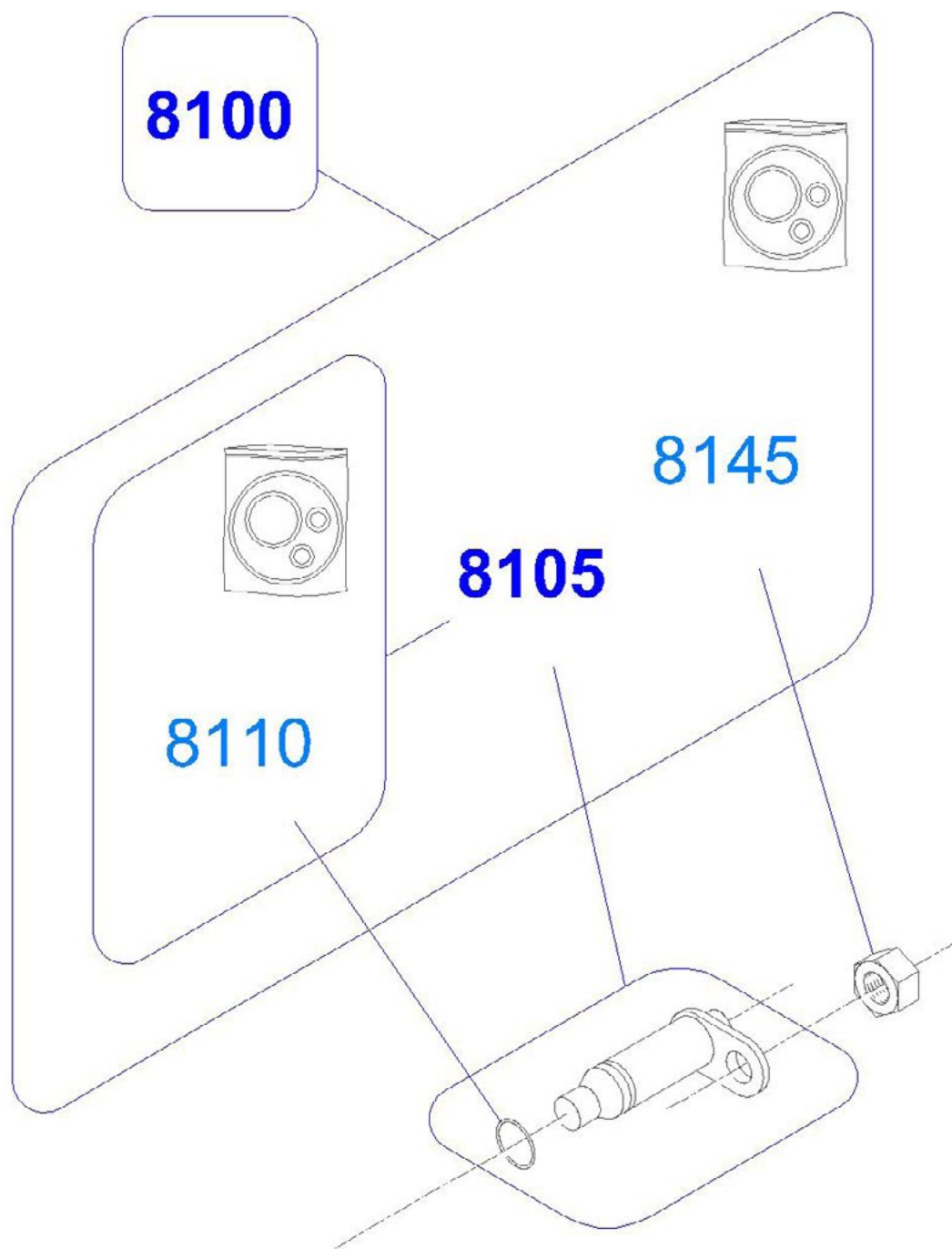
## Wheel Motor Breakdown, GA 2005 continued



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| Level | Item | Description | Reference | Qty |
|-------|------|-------------|-----------|-----|
| 1     | 3505 | CAM         | A19556G   | 1   |
| 1     | 9350 | SEAL KIT    | A36606P   | 1   |
| 2     | 2520 | PLUG        |           | 1   |
| 2     | 4085 | SEAL        |           | 2   |

## Wheel Motor Breakdown, GA 2005 continued

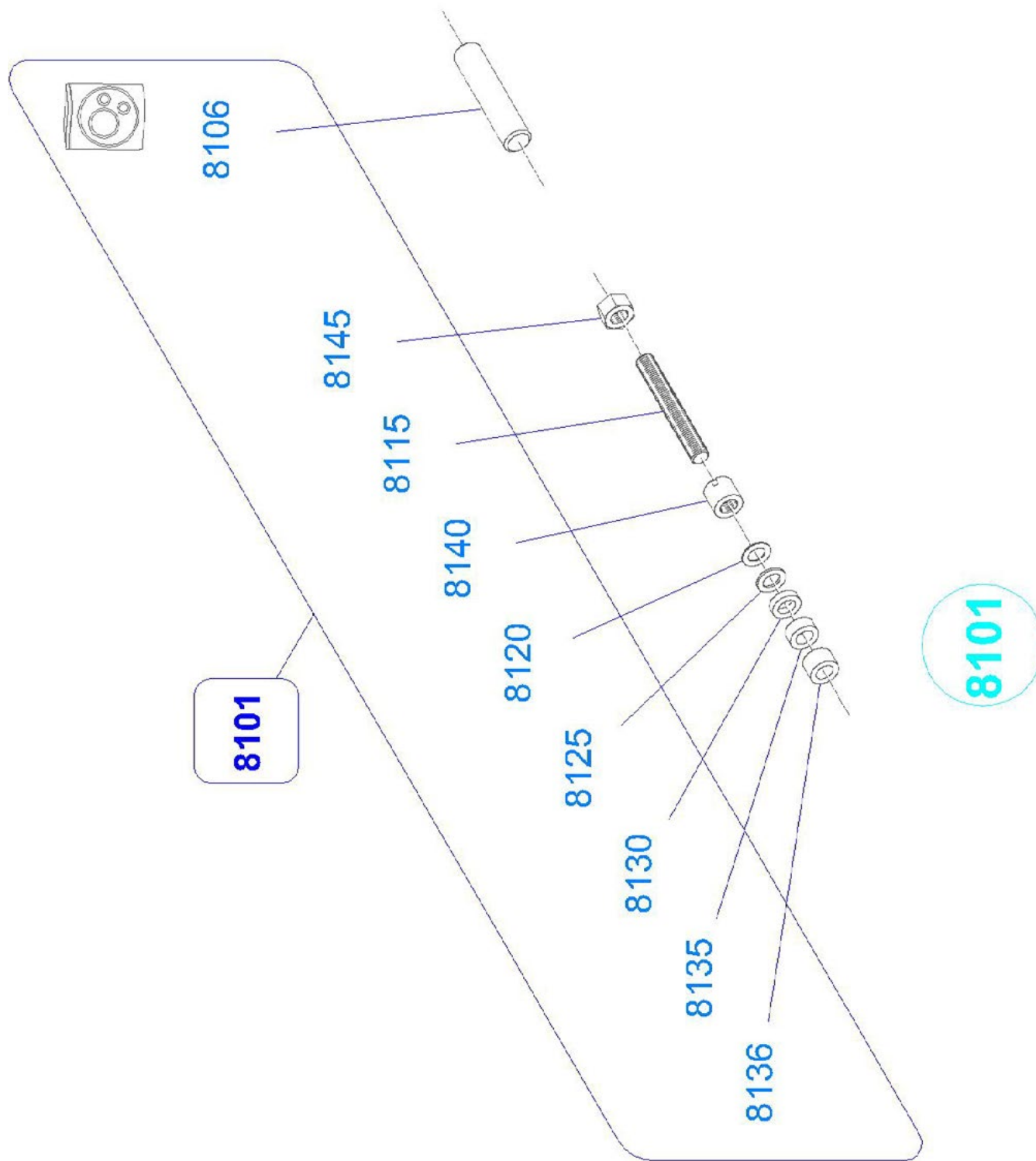
**8100**

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| Level | Item | Description       | Reference  | Qty  |
|-------|------|-------------------|------------|------|
| 1     | 8100 | REPAIR KIT        | A35748G    | 1    |
| 2     | 8105 | Other SUBASSEMBLY | A08396B    | 1    |
| 3     | 8106 | PLUG              | A04033J    | 1    |
| 3     | 8110 | SEAL              | 001630414P | 1    |
| 2     | 8145 | NUT               |            | 1    |
| 3     | 8910 | BLANK             | B09746S    | 0.01 |

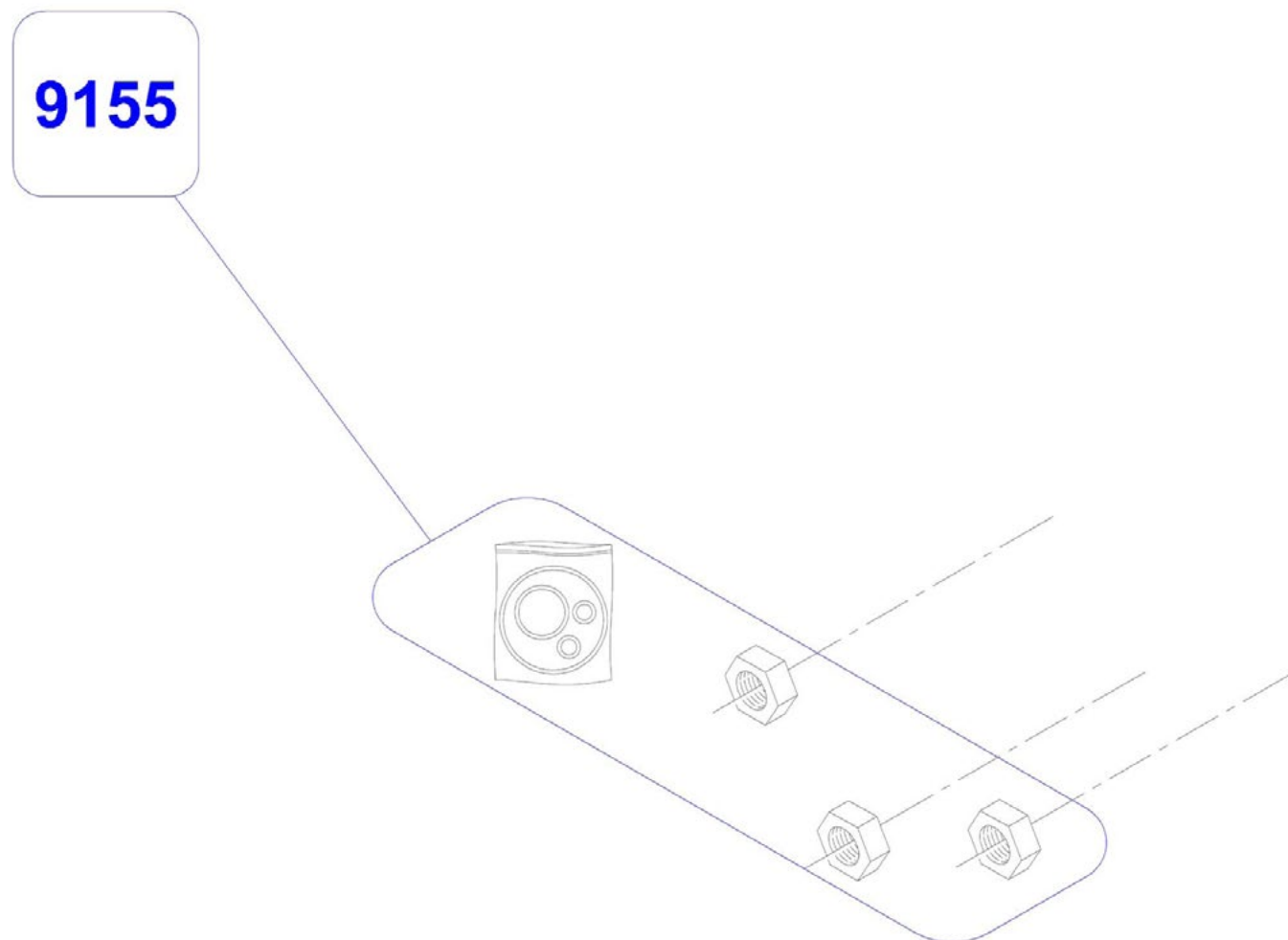
## Wheel Motor Breakdown, GA 2005 continued



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| Level | Item | Description  | Reference  | Qty    |
|-------|------|--------------|------------|--------|
| 1     | 8101 | REPAIR KIT   | A35743B    | 1      |
| 2     | 8106 | SPEED SENSOR | A29661Q    | 1      |
| 2     | 8115 | SCREW        |            | 1      |
| 3     | 8190 | BLANK        | B09745R    | 0.01   |
| 3     | 8910 | BLANK        | A06453P    | 0.01   |
| 2     | 8115 | SCREW        |            | 1      |
| 3     | 8910 | BLANK        | B09745R    | 0.01   |
| 2     | 8120 | WASHER       |            | 1      |
| 3     | 0    | LINK         | 901914101U | 0.01   |
| 4     | 0    |              | A07813S    | 0.0001 |
| 2     | 8125 | WASHER       | A03664H    | 2      |
| 3     | 0    | LINK         | 901914101U | 0.01   |
| 4     | 0    |              | A07813S    | 0.0001 |
| 2     | 8130 | WASHER       | A03478F    | 1      |
| 3     | 0    | LINK         | 901914101U | 0.01   |
| 4     | 0    |              | A07813S    | 0.0001 |
| 2     | 8135 | WASHER       | A03486P    | 4      |
| 3     | 0    | LINK         | 901914101U | 0.01   |
| 4     | 0    |              | A07813S    | 0.0001 |
| 2     | 8136 | WASHER       | A13876H    | 2      |
| 2     | 8140 | NUT          | 000034113E | 1      |
| 2     | 8145 | NUT          |            | 1      |
| 3     | 8910 | BLANK        | B09746S    | 0.01   |

## Wheel Motor Breakdown, GA 2005 continued





| Level | Item | Description | Reference  | Qty |
|-------|------|-------------|------------|-----|
| 1     | 9155 | NUT         | 003034554D | 1   |
| 2     | 1015 | NUT         |            | 5   |

## HYDRAULIC PUMP BREAKDOWN

## GA 2000

## Pump, Med Duty Manual Piston SAE MT 13T Shaft

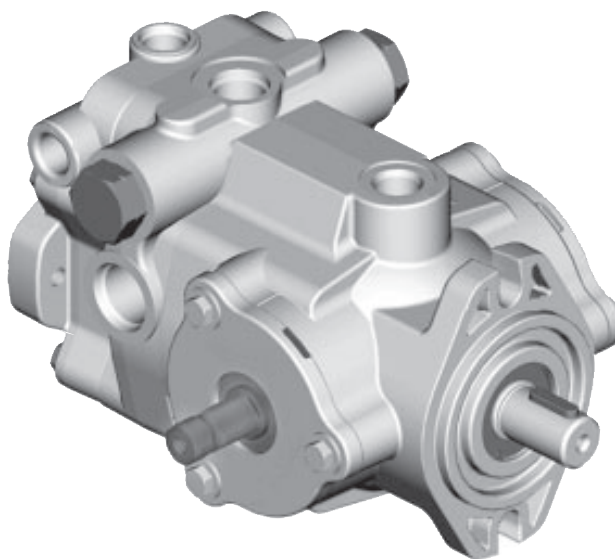
70160-RGV-03

| Name         | Title/Model Code                               |
|--------------|--|
| 70160-RGV-03 | ADB12R2ARA11TT1E0AAA210A00000A0C               |
| 70142-200    | SHAFT, DRIVE - SPLINED                         |
| 113482-013   | ENDCOVER SUBASSY                               |
| 70160-307    | HOUSING SUBASSY                                |
| 70111-692    | ROTATING KIT SUBASSY                           |
| 70160-622    | SWASHPLATE                                     |
| 16048-312    | WASHER   |
| 16077-26     | RETAINING RING                                 |
| 16078-16     | RING, RETAINING                                |
| 16241-1625   | BEARING, THRUST                                |
| 16241-C1625  | RACE, BEARING                                  |
| 16253-16     | SEAL, SHAFT                                    |
| 70111-701    | GASKET, HOUSING                                |
| 70160-504    | INSERT, SWASHPLATE                             |
| 106013-038   | WASHER   |
| 16253-214    | SEAL, SHAFT                                    |
| 16136-610    | CP SC  |
| 110700-500   | RELIEF VALVE SUBASSY                           |
| 110700-500   | RELIEF VALVE SUBASSY                           |
| 16320-117    | BEARING, CONE                                  |
| 70160-508    | PLATE, COVER                                   |
| 70160-510    | PLATE, COVER                                   |
| 16028-304    | PIN, DOWEL                                     |
| 16136-532    | SCREW, CAP                                     |
| 16136-536    | SCREW, CAP                                     |
| 70142-600    | PLATE, COVER                                   |
| 16007-14     | O RING   |
| 16136-610    | CP SC  |
| 70111-703    | O-RING   |
| 70142-389    | CHARGE PUMP ADAPTER SUBASSY (NO CHARGE RELIEF) |
| 70111-642    | GEROTOR & COUPLER SUBASSY                      |
| 16321-117    | CUP, BEARING                                   |
| 70160-515    | RING, CRUSH                                    |
| 16015-44     | O-RING   |
| 106013-031   | WASHER   |
| 70112-007    | PLATE, VALVE                                   |
| 16103-108    | PG ASY   |
| 16103-308    | PLUG ASSEMBLY                                  |
| 16096-108    | SHIPPING PLUG                                  |
| 16096-112    | SHIPPING PLUG                                  |

**Eaton®**  
Medium Duty Piston Pump



**Parts Information**



**Model 70160 Variable Displacement Piston Pump**  
20,3 cm<sup>3</sup>/r [1.24 in<sup>3</sup>/r] or 23,6 cm<sup>3</sup>/r [1.44 in<sup>3</sup>/r] Displacements  
Manual Controlled

v-02

## Hydraulic Pump Breakdown, GA 2000 continued

## Model 70160

**Identification Numbers - Manually Variable Displacement Piston Pump**

Stamped on each unit's mounting flange.

- A - Product Number Description  
 70160 = Single Piston Pump  
 78162 = Single Piston Pump with Gear Pump  
 78161 = Tandem Piston Pumps  
 78163 = Tandem Piston Pumps with Gear Pump  
 B - Sequential Numbering  
 C - Engineering Design Code

**Single Pump - Product Number:**

**7 0 1 6 0 - R A A - 02**

A                      B                      C

**Tandem Pumps - Product Number:**

**7 8 1 6 3 - R A B - 02**

A                      B                      C

**Serial Number Code:**

**A 98 01 31 JB**

Revision level of parts list.                   Tester's Initials

Last two digits of year built.                Day of Month (two digits)

( 98 for 1998 etc.)                Month (two digits)

**Each order must include the following information.**

1. Product and/or Part Number
2. Serial Number Code
3. Part Name
4. Quantity

**Tools Required**

- 1/2, 9/16, 7/8 & 1-1/8 in. sockets and/or end wrenches
- Torque wrench (136 N·m [100 lbf·ft] capacity)
- Ratchet wrench
- 5/16 in. and 7/16 Allen wrenches or bit sockets
- Internal and external retaining ring pliers
- Small screwdrivers (2)
- Hammer (soft face)
- Light Petroleum Jelly
- Seal driver or similar tool



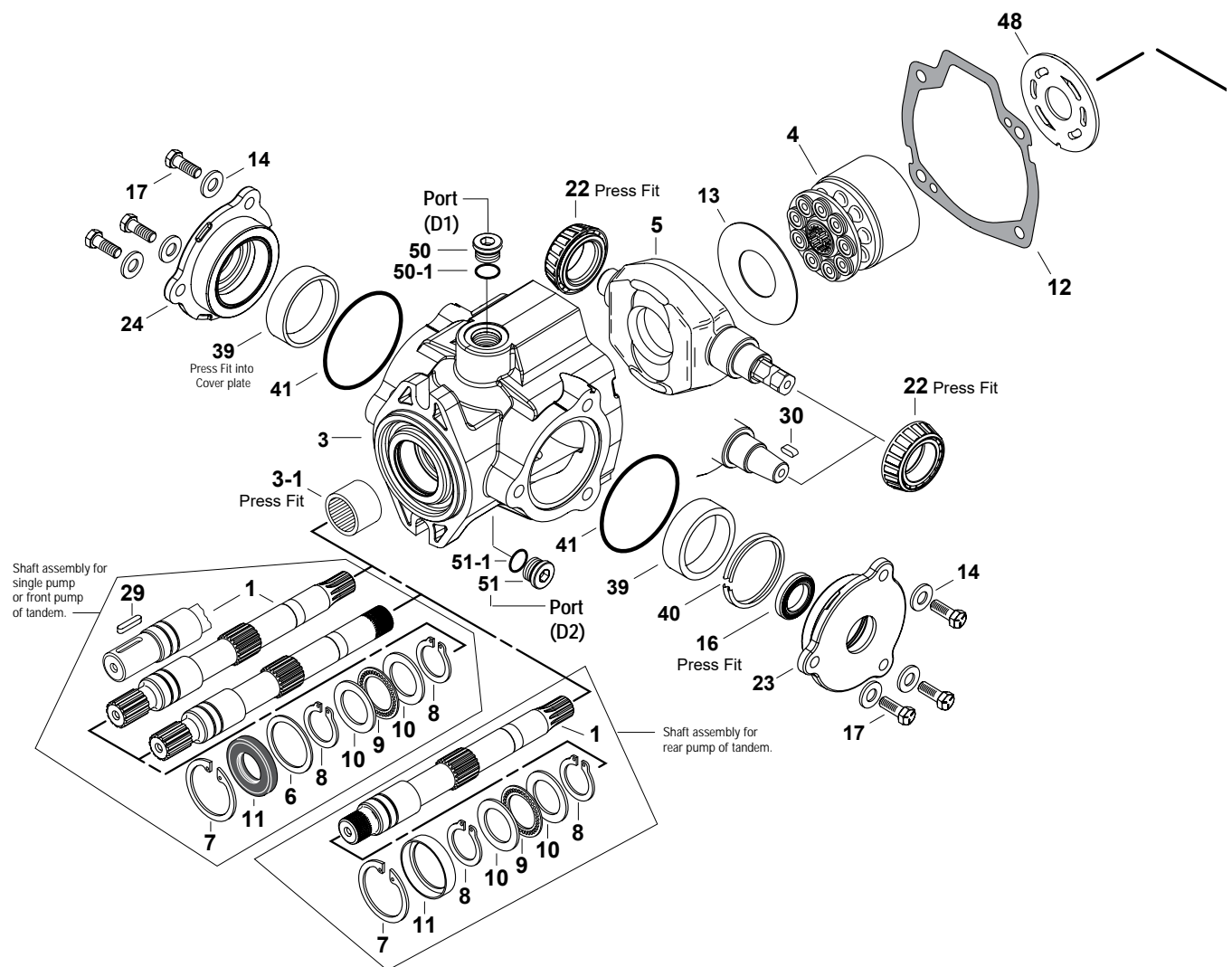
## Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



## Parts Drawing

Pump drawn below is typical of a right hand pump.

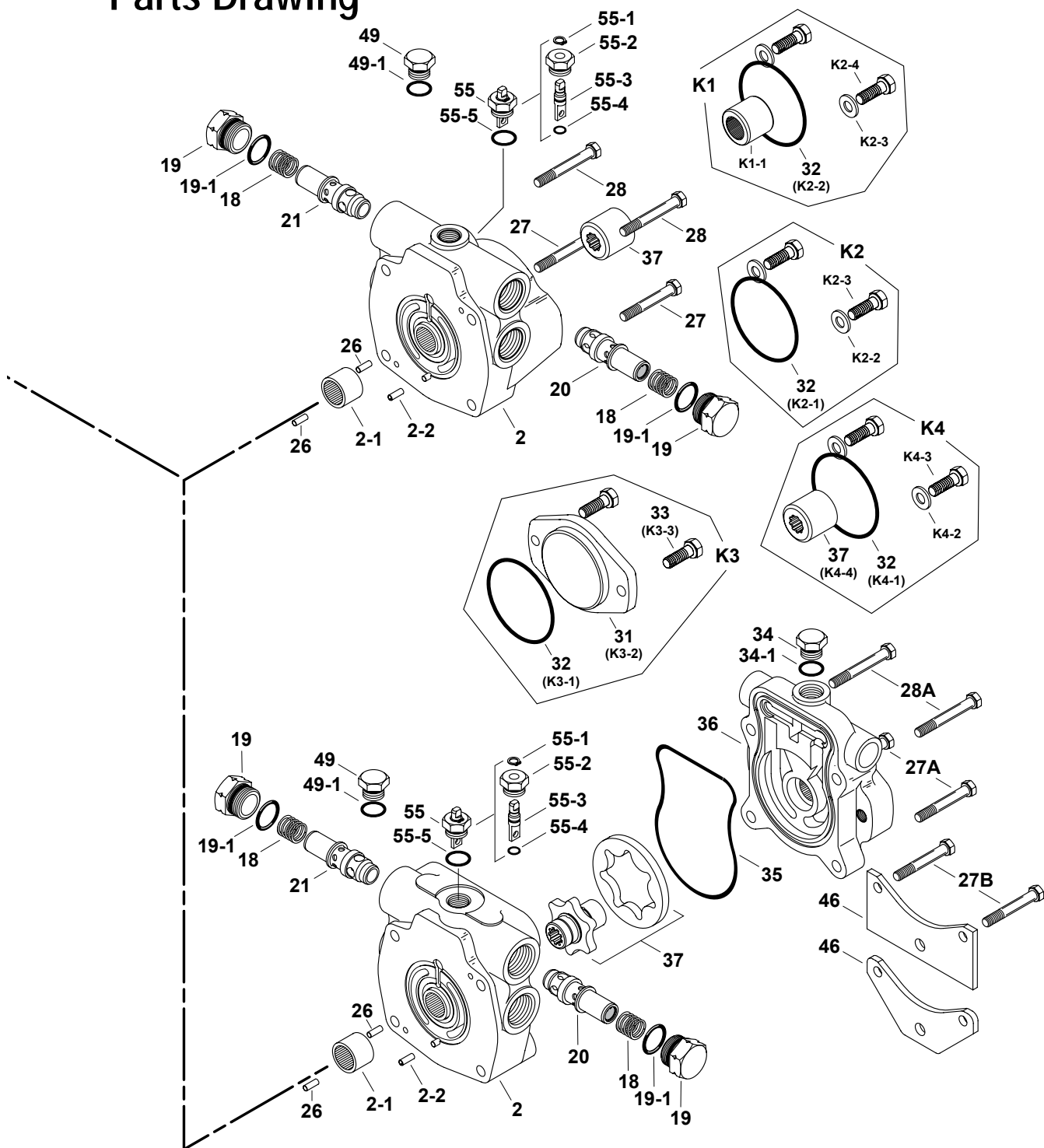


Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



## Parts Drawing



## Hydraulic Pump Breakdown, GA 2000 continued

## Model 70160



## Parts List

Parts listed below are to service catalog units. Other variations of units are built that have parts altered for special requirements. The non-catalog units can be serviced with the parts list below using caution for proper identification. Contact an Eaton representative with any questions concerning your selection. Have your final assembly number ready when contacting representative.

| Item   | 02 Part No. | Qty. | Description   |
|--------|-------------|------|---|
| 1      | ◆           | 1    | Drive Shaft (Identification drawing on page #8)                                       |
| 2      | ◆           | 1    | Endcover Assembly (Identification drawing and parts list on page #9)                  |
| 3      | ◆           | 1    | Housing Assembly (Identification drawing on page #10)                                 |
| 3-1    | 16238-11616 | 1    | Bearing (Press Fit)   |
| 4      | 70111-692   | 1    | Rotating Kit Assembly (parts list on page #10)  |
| 5      |             | 1    | Swashplate, 20,3 cm <sup>3</sup> /r [1.24 in <sup>3</sup> /r] Displacement            |
|        | 70160-623   |      | Square Arm  |
|        | 70160-617   |      | Tapered Arm   |
| 5      |             | 1    | Swashplate, 23,6 cm <sup>3</sup> /r [1.44 in <sup>3</sup> /r] Displacement            |
|        | 70160-620   |      | Square Arm  |
|        | 70160-618   |      | Tapered Arm   |
| 6      | 16048-312   | 1    | Washer  |
| + 7    | 16077-26    | 1    | Retaining Ring  |
| + 8    | 16078-16    | 2    | Retaining Ring  |
| 9      | 16241-1625  | 1    | Thrust Bearing  |
| 10     | 16241-C1625 | 2    | Bearing Race  |
| + 11   | GA 16253-16 | 1    | Shaft Seal, Drive   |
| 11     | 16253-216   | 1    | Viton Shaft Seal, Drive   |
| 11     | 70102-636   | 1    | Spacer  |
| + 12   | 70111-701   | 1    | Housing Gasket  |
| 13     | 70160-504   | 1    | Swashplate Insert   |
| 14     | 106013-038  | 6    | Washer  |
| + 16   | 16253-214   | 1    | Shaft Seal, Trunnion  |
| 17     | 16136-610   | 6    | Screw, Cap  |
| 18     | 17086-017   | 2    | Spring  |
| 19     | 32060-8     | 2    | Plug Assembly   |
| + 19-1 | 16015-18-90 | 2    | O-ring, 2,38 mm Dia. x 22,23 mm ID. [.0937 in. Dia. x .875 in. ID.]                   |
| 20     | ◆           | 1    | Relief Valve for Port "C" (Identification drawing on page #11)                        |
| 21     | ◆           | 1    | Relief Valve for Port "D" (Identification drawing on page #11)                        |
| 22     | 16320-117   | 2    | Cone Bearing  |
| 23     | 70160-508   | 1    | Cover Plate   |
| 24     | 70160-510   | 1    | Cover Plate   |
| 26     | 16028-304   | 2    | Dowel Pin   |
| 27     | 16136-520   | 2    | Cap Screws, 5/16-18, 50,8 mm [2 in.] Long   |
| 27A    | 16136-532   | 2    | Cap Screws, 5/16-18, 82,6 mm [3.25 in.] Long  |
| 27B    | 16136-534   | 2    | Cap Screws, 5/16-18, 88,9 mm [3.5 in.] Long   |
| 28     | 16136-524   | 2    | Cap Screws, 5/16-18, 63,5 mm [2.5 in.] Long   |
| 28A    | 16136-536   | 2    | Cap Screws, 5/16-18, 95,3 mm [3.75 in.] Long  |
| 28B    | 16136-540   | 2    | Cap Screws, 5/16-18, 101,6 mm [4.00 in.] Long   |
| 29     |             | 1    | Key, Drive Shaft  |
|        | 24500-619   |      | Used with 7/8 in. dia. drive shaft.   |
| 30     | 16246-430   | 1    | Key, Tapered Arm  |
| 31     | 70142-600   | 1    | Cover Plate (In K3 kit)   |
| + 32   | 16007-14    | 1    | O-ring (In K1, K2, K3, & K4 kit)  |
| 33     | 16036-610   | 2    | Cap Screws, Cover Plate (In K3 kit)   |
| 34     | 16103-108   | 1    | Plug Assembly   |
| + 34-1 | 16133-8     | 1    | O-ring, 2,21 mm Dia. x 16,36 mm ID. [.087 in. Dia. x .644 in. ID.]                    |
| + 35   | 70111-703   | 1    | Molded O-ring   |
| 36     | ◆           | 1    | Charge Pump Adaptor (Identification drawing and parts list on page #12 & #13)         |
| 37     |             | 1    | Gerotor set and coupler sub-assembly  |
|        | 70111-642   |      | 6,9 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] displacement, 6,35 mm [.25 in.] width |
|        | 70111-646   |      | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] displacement, 12,7 mm [.5 in.] width |

Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



## Parts List

| Item   | 02 Part No. | Qty. | Description  |
|--------|-------------|------|--|
| 37     | 70111-667   | 1    | 9 tooth coupler (In Kit 4)   |
| 37     | 70111-687   | 1    | 11 tooth coupler (In Kit 5)  |
| 39     | 16321-117   | 2    | Cup, Bearing   |
| 40     | N/S         | 1    | Ring, Crush (Shim kit must be ordered to replace crush ring).          |
| 41     | 16015-46    | 2    | O-ring, 2.38 mm Dia. x 66.68 mm I.D. [.0937 in. Dia. x 2.625 in. I.D.] |
| 42     | 106013-031  | 4    | Washer   |
| 46     | 70111-632   | 1    | Mounting Bracket, Square shaped  |
| 46     | 70111-709   | 1    | Mounting Bracket, "V" shaped   |
| 48     | ◆           | 1    | Valve Plate (Identification drawing on page #11)                       |
|        | 70113-008   |      | Righthand (CW) Rotation  |
|        | 70113-009   |      | Lefthand (CCW) Rotation  |
| + 49   | 16103-108   | 1    | Plug Assembly  |
| 49-1   | 16133-8     | 1    | O-ring, 2,21 mm Dia. x 16,36 mm I.D. [.087 in. Dia. x .644 in. I.D.]   |
| 50     | 16103-308   | 1    | Plug Assembly  |
| + 50-1 | 16133-8     | 1    | O-ring, 2,21 mm Dia. x 16,36 mm I.D. [.087 in. Dia. x .644 in. I.D.]   |
| 51     | 16103-308   | 1    | Plug Assembly  |
| + 51-1 | 16133-8     | 1    | O-ring, 1,98 mm Dia. x 11,89 mm ID. [.078 in. Dia. x .468 in. ID.]     |
| 55     | 70300-610   | 1    | Bypass Valve sub-assembly  |
| + 55-1 | 16078-6     | 1    | Retaining Ring   |
| 55-2   | 70300-609   | 1    | Separator Plug   |
| 55-3   | 70411-502   | 1    | Separator  |
| + 55-4 | 16003-7     | 1    | O-ring, 1,59 mm Dia. x 9,53 mm I.D. [.0625 in. Dia. x .375 in. I.D.]   |
| + 55-5 | 16133-8     | 1    | O-ring, 2,21 mm Dia. x 16,36 mm I.D. [.087 in. Dia. x .644 in. I.D.]   |

### Mounting Kits

|      |           |   |   |
|------|-----------|---|---|
| K1   | 70142-944 | 1 | Tandem Piston Pump Mounting Kit                                     |
| K1-1 | 70111-666 | 1 | 35T Coupler, 36,8 mm [1.45 in.] long                                |
| K1-2 | 16007-14  | 1 | O-ring, 1,59 mm Dia. x 101,6 mm ID. [.0625 in. Dia. x 4 in. ID.]    |
| K1-3 | 16136-613 | 2 | Cap Screws  |
| K1-4 | 16048-8   | 2 | Washer  |
| K2   | 70442-929 | 1 | Gear Pump Mounting Kit  |
| K2-1 | 16007-14  | 1 | O-ring, 1,59 mm Dia. x 82,55 mm ID. [.0625 in. Dia. x 3.25 in. ID.] |
| K2-2 | 16048-113 | 2 | Washer  |
| K2-3 | 16136-612 | 2 | Cap Screws  |
| K3   | 70142-915 | 1 | Cover Plate Kit   |
| K3-1 | 16007-14  | 1 | O-ring, 1,59 mm Dia. x 82,55 mm ID. [.0625 in. Dia. x 3.25 in. ID.] |
| K3-2 | 70142-600 | 1 | Cover Plate   |
| K3-3 | 16136-610 | 2 | Cap Screws  |
| K4   | 70144-903 | 1 | Gear Pump Mounting Kit with Coupler                                 |
| K4-1 | 16007-14  | 1 | O-ring, 1,59 mm Dia. x 101,6 mm ID. [.0625 in. Dia. x 4 in. ID.]    |
| K4-2 | 16048-113 | 2 | Washer  |
| K4-3 | 16136-612 | 2 | Cap Screws  |
| K4-4 | 70111-667 | 1 | 9T Coupler  |

### Seal Repair Kit

|           |   |   |
|-----------|---|---|
| 70160-902 | 1 | Seal Repair Kit for 70160 piston pump.  |
| 70160-903 | 1 | Control Shaft Shim Kit (to replace crush ring (40) after replacement of cover plate). |

|               |     |                                    |
|---------------|-----|------------------------------------|
| <b>Legend</b> | ◆   | Refer to specific item parts list. |
|               | +   | Common parts to seal repair kits.  |
|               | N/S | Not Serviceable                    |



Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



## Item 1 - Drive Shaft Identification

| Part Number                                 | Input Drive | Where Used                     | Output Drive                    |
|---|-------------|--------------------------------|---------------------------------|
|   |             |                                | 9 Tooth<br>.81 Min. Full Depth  |
|   |             | Single Pump, with Gerotor      | 9 Tooth<br>.81 Min. Full Depth  |
|   |             | Single Pump, with Gerotor      | 9 Tooth<br>.625 Min. Full Depth |
| 70142-200 [13 Tooth]                        |             | Single Pump, No Gerotor        | 9 Tooth<br>.625 Min. Full Depth |
| 70142-203 [7/8 in. Keyed]                   |             | Single Pump, No Gerotor        | 35 Tooth<br>.76 Min. Full Depth |
| 70142-215 [13 Tooth]                        |             | Tandem Front Pump, No Gerotor  | 9 Tooth<br>.625 Min. Full Depth |
| 70142-225 [7/8 in. Keyed]                   |             | Tandem Rear Pump, No Gerotor   | 9 Tooth<br>.81 Min. Full Depth  |
| 70142-201 [13 Tooth]                        |             | Tandem Rear Pump, with Gerotor |                                 |
| 70142-212<br>[35 Tooth] .69 Min. Full Depth |             |                                |                                 |
| 70142-214<br>[35 Tooth] .69 Min. Full Depth |             |                                |                                 |

Hydraulic Pump Breakdown, GA 2000 continued

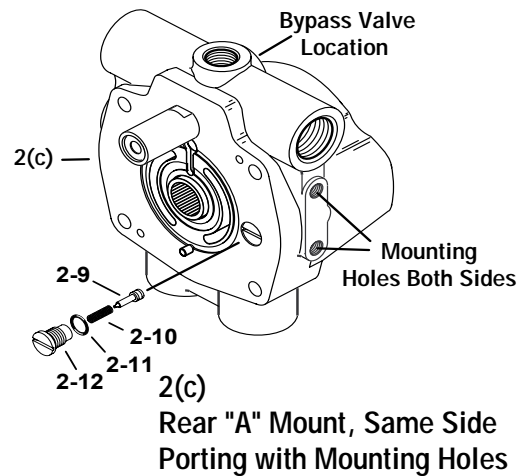
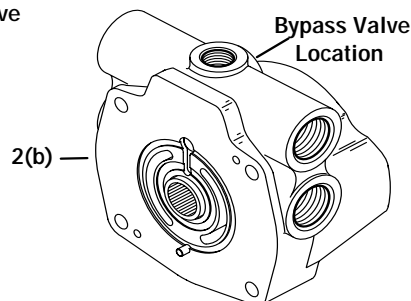
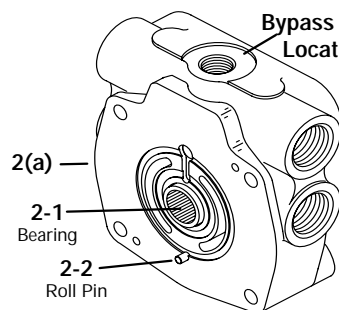
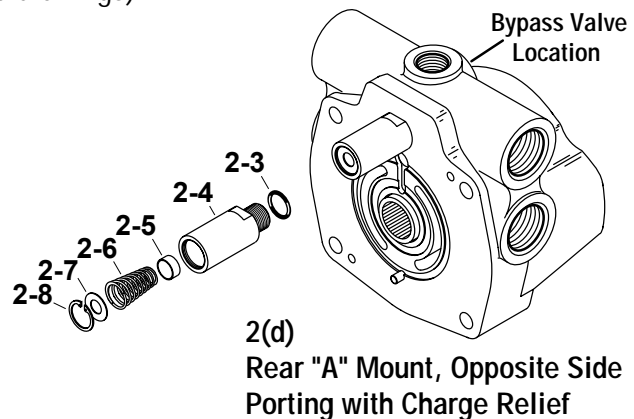
Model 70160



## Item 2 - Endcover Assembly Identification

### Item 2 - Parts List (Refer to Identification chart and drawings)

| Item | Part Number     | Qty. | Description            |
|------|-----------------|------|------------------------|
| 2    | See chart below |      | Endcover Assembly      |
| 2-1  | 70420-43        | 1    | Bearing                |
| 2-2  | 16026-610       | 1    | Roll Pin               |
| 2-3  | 16133-6         | 1    | O-ring                 |
| 2-4  | 70111-711       | 1    | Charge Relief Housing  |
| 2-5  | 70111-507       | 1    | Poppet Filter Relief   |
| 2-6  | 17000-48B       | 1    | Spring (100-150 PSI)   |
| 2-7  | 16048-260       | 1    | Washer                 |
| 2-8  | 16077-10        | 1    | Retaining Ring         |
| 2-9  | 70400-508       | 1    | Bleed-off Valve Poppet |
| 2-10 | 17023-12        | 1    | Spring                 |
| 2-11 | 16133-5         | 1    | O-ring                 |
| 2-12 | 70400-501       | 1    | Cartridge              |



### Item 2 - Endcover Assembly Identification (Refer to drawings above)

| Item | Part Number | Charge Pump | Main Port       | Bypass Valve | Charge Relief to Case | Charge Relief Setting bar [PSI] | Special Feature            |
|------|-------------|-------------|-----------------|--------------|-----------------------|---------------------------------|----------------------------|
| 2(a) | 70119-005   | Yes         | Opposite Sides* | Yes          | No                    | ----                            | ----                       |
| 2(b) | 70117-021   | No          | Opposite Sides* | Yes          | No                    | ----                            | ----                       |
| 2(c) | 70121-022   | No          | Same Side*      | Yes          | Yes                   | 6,89-10,34<br>[100-150]         | Bleed Off & Mounting Holes |
| 2(d) | 70117-023   | No          | Opposite Sides* | Yes          | Yes                   | 6,89-10,34<br>[100-150]         | ----                       |

\* Port Size: 1 1/16-12 UN-2B

Hydraulic Pump Breakdown, GA 2000 continued

Model 70160

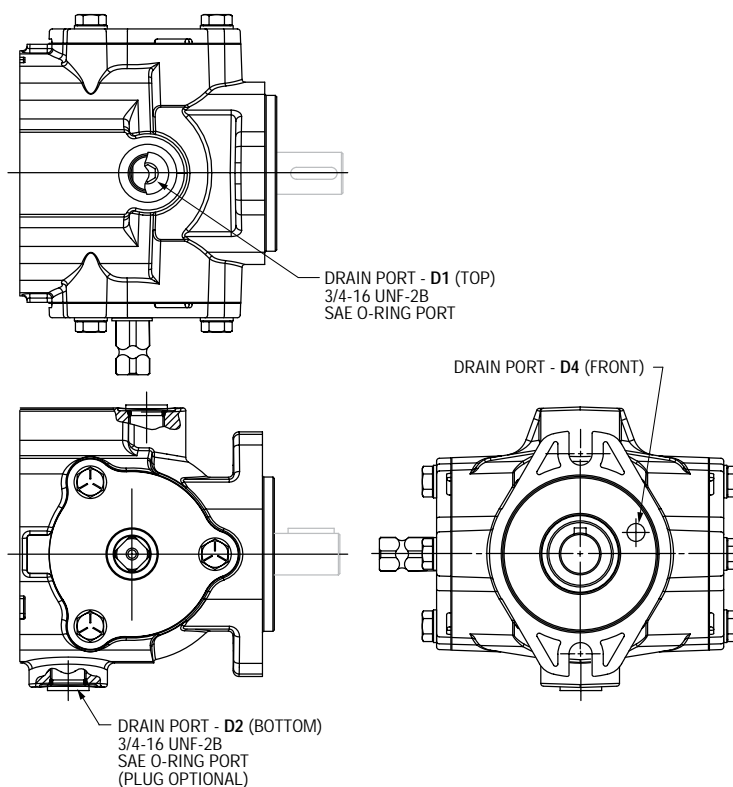


## Item 3 - Housing Assembly Identification

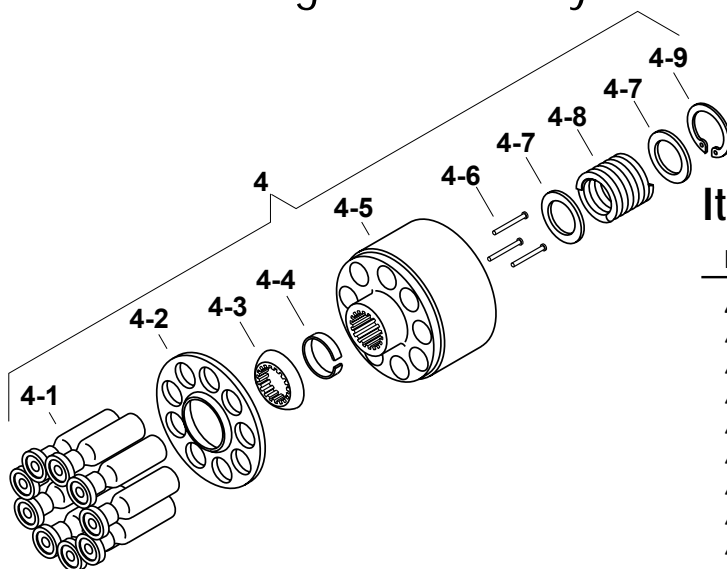
### Item 3 -

#### Housing Assembly Identification

| Item | Part Number | Port Machined |
|------|-------------|---------------|
| 3    | 70160-307   | D1 & D2       |
| 3    | 113077-001  | D1, D2, & D4  |



## Item 4 - Rotating Kit Assembly



### Item 4 - Rotating Kit Assembly

| Item                      | Part Number | Qty. | Description         |
|---------------------------|-------------|------|---------------------|
| 4                         | 70111-692   | 1    | Rotating Kit Assy.  |
| 4-1                       | NSS         | 9    | Piston Assembly     |
| 4-2                       | NSS         | 1    | Shoe Retainer       |
| 4-3                       | NSS         | 1    | Shoe Retainer Pivot |
| 4-4                       | NSS         | 1    | Pin retainer        |
| 4-5                       | NSS         | 1    | Cylinder Barrel     |
| 4-6                       | NSS         | 3    | Pins                |
| 4-7                       | NSS         | 2    | Washer              |
| 4-8                       | NSS         | 1    | Spring              |
| 4-9                       | NSS         | 1    | Retaining Ring      |
| NSS - Not Sold Separately |             |      |                     |

Hydraulic Pump Breakdown, GA 2000 continued

Model 70160

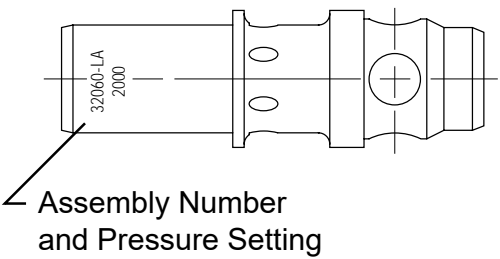


Item 20 or 21 - Relief Valve

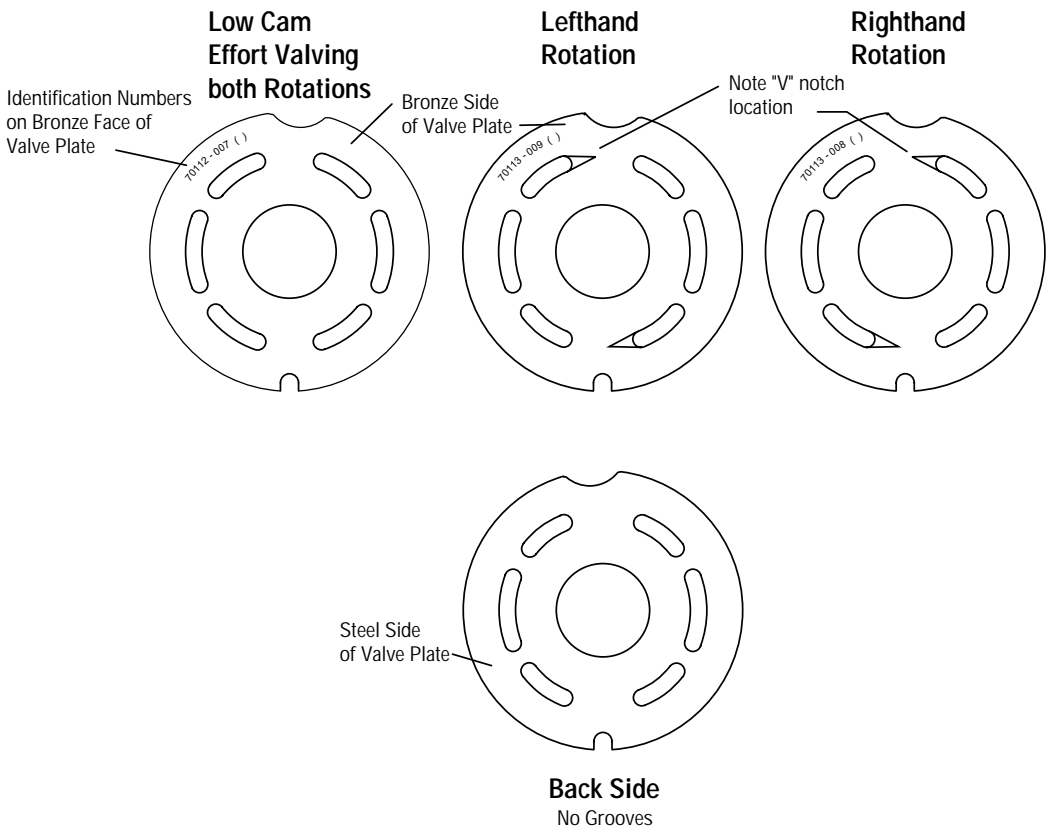
Item 20 or 21 -

Internal Relief Valve Settings Available

| Part Number | bar [PSI]   |
|-------------|-------------|
| 32060-LA    | 138 [2000]  |
| 32060-QA    | 172 [2500]  |
| 32060-UA    | 207 [3000]  |
| 32060-WA    | 241 [3500]  |
| 32060-ZA    | 276 [4000]  |
| 32060-XA    | 310 [4500]  |
| 32060-IA    | 345 [5000]  |
| 70111-518   | Seat, Valve |



Item 48 - Valve Plate





Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



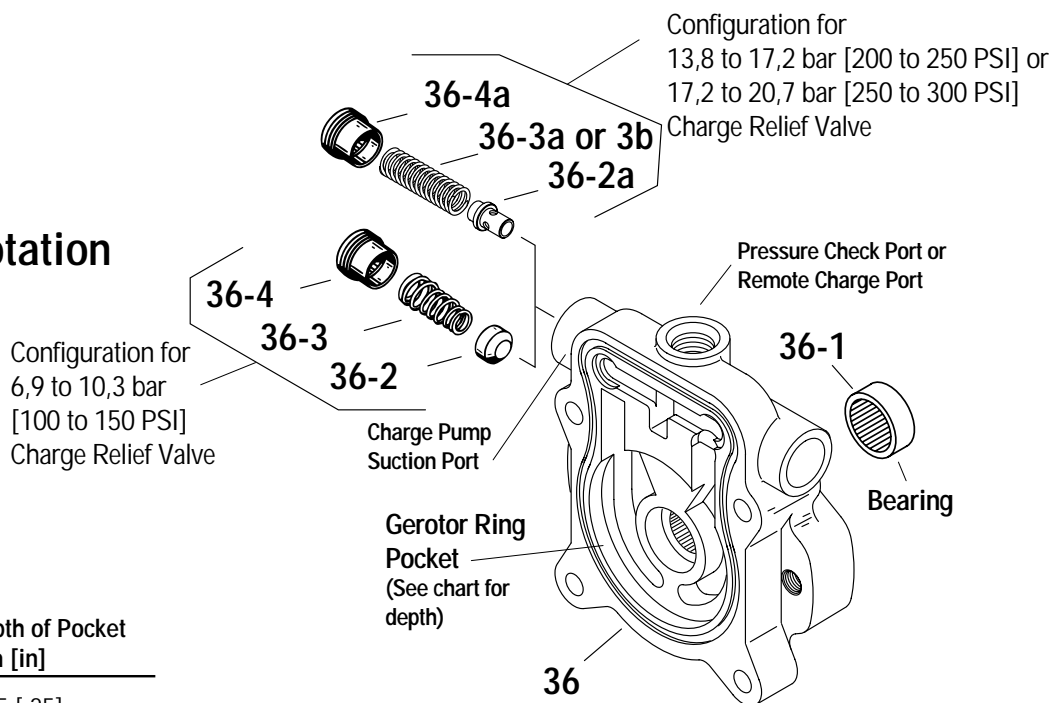
## Item 36 -

### Charge Pump Adapter Assembly Identification

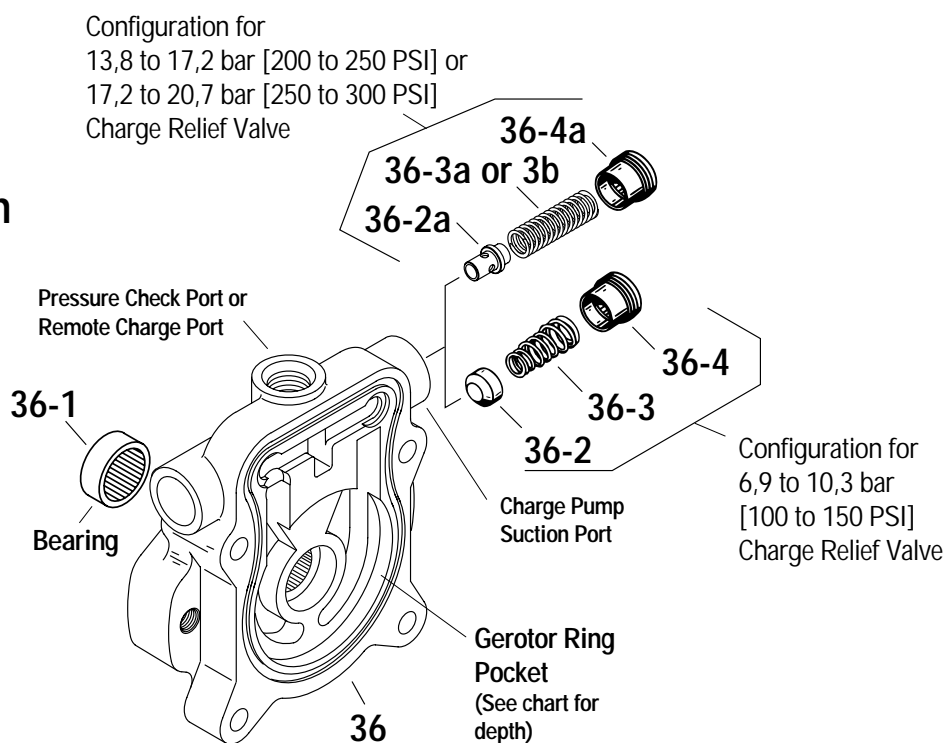
#### Right Hand Rotation

##### Gerotor Pocket Depth

| Displacement<br>cm <sup>3</sup> /r [in <sup>3</sup> /r] | Depth of Pocket<br>mm [in] |
|---|----------------------------|
| 6,9 [.42]   | 6,35 [.25]                 |
| 13,8 [.84]  | 12,7 [.50]                 |



#### Left Hand Rotation



Hydraulic Pump Breakdown, GA 2000 continued

Model 70160



## Item 36 - Charge Pump Adapter Assembly

### 6,9 to 10,3 bar [100 to 150 PSI] Charge Relief Setting

| Item | Part No.   | Qty. | Description                   | Rotation  | Displacement                                     |
|------|------------|------|-------------------------------|-----------|--|
| 36   | 70142-314  | 1    | Assembly, Charge Pump Adapter | Righthand | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
|      | 70142-306  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] |
|      | 70141-397  | 1    | Assembly, Charge Pump Adapter | Righthand | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] |
|      | 70142-359  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
| 36-1 | 16239-1148 | 1    | Bearing (press fit)           |           |  |
| 36-2 | 70111-507  | 1    | Poppet, Cup                   |           |  |
| 36-3 | 17000-48B  | 1    | Spring, Tapered               |           |  |
| 36-4 | 70400-505  | 1    | Spring Retainer               |           |  |

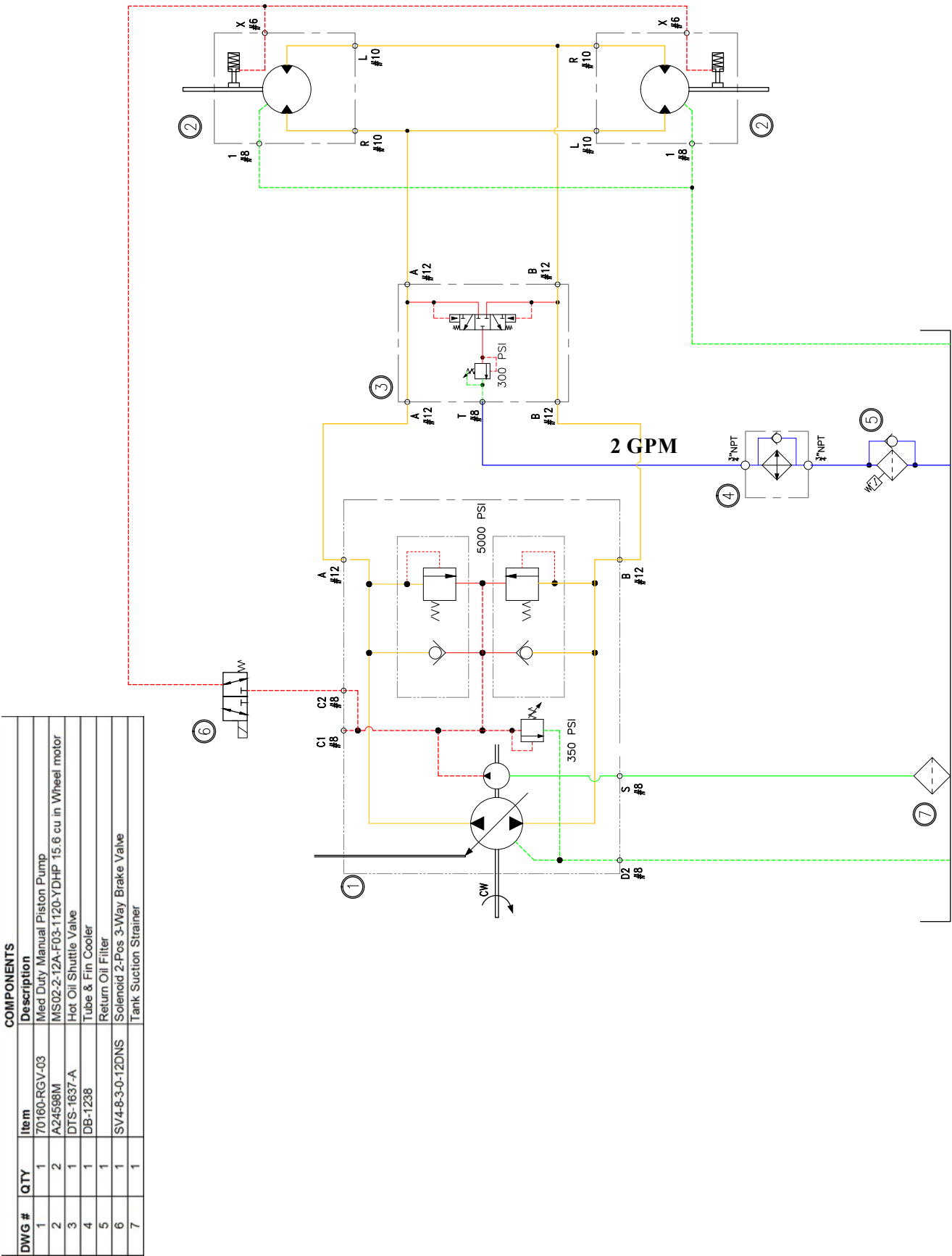
### 13,8 to 17,2 bar [200 to 250 PSI] Charge Relief Setting

| Item  | Part No.   | Qty. | Description                   | Rotation  | Displacement                                     |
|-------|------------|------|-------------------------------|-----------|--|
| 36    | 70142-373  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
|       | 70142-377  | 1    | Assembly, Charge Pump Adapter | Righthand | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
|       | 70142-380  | 1    | Assembly, Charge Pump Adapter | Righthand | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] |
|       | 70142-385  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] |
| 36-1  | 16239-1148 | 1    | Bearing (press fit)           |           |  |
| 36-2a | 70400-685  | 1    | Poppet, Pin                   |           |  |
| 36-3a | 17056-40   | 1    | Spring, Color "Light Green"   |           |  |
| 36-4a | 70400-512  | 1    | Spring Retainer               |           |  |

### 17,2 to 20,7 bar [250 to 300 PSI] Charge Relief Setting

| Item  | Part No.   | Qty. | Description                   | Rotation  | Displacement                                     |
|-------|------------|------|-------------------------------|-----------|--|
| 36    | 70142-376  | 1    | Assembly, Charge Pump Adapter | Righthand | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
|       | 70142-381  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 6,88 cm <sup>3</sup> /r [.42 in <sup>3</sup> /r] |
|       | 70142-386  | 1    | Assembly, Charge Pump Adapter | Lefthand  | 13,8 cm <sup>3</sup> /r [.84 in <sup>3</sup> /r] |
| 36-1  | 16239-1148 | 1    | Bearing (press fit)           |           |  |
| 36-2a | 70400-685  | 1    | Poppet, Pin                   |           |  |
| 36-3b | 17056-41   | 1    | Spring, Color "Pink"          |           |  |
| 36-4a | 70400-512  | 1    | Spring Retainer               |           |  |

HYDRAULIC SCHEMATIC



**REFERENCE**

**KAWASAKI ENGINE MANUAL**

GA 2150 Engine, 601CC horizontal, FH601D-FS01S



### G V F WARRANTY

Gillison's Variety Fabrication, Inc. will replace or repair at GVF option, any GVF manufactured item that is, in the opinion of GVF, defective in material or workmanship for a period of 1 year from the date of purchase, and is returned to the GVF plant or service center at the expense of the customer. This warranty is made expressly in lieu of all other warranties expressed or implied. **The Warranty Registration card must be completed in full and returned to GVF within thirty (30) days of date of delivery to qualify for this warranty.**

The owner is specifically responsible for the operation and service of the machine. This warranty shall not apply to any product that has been subject to misuse, negligence or accident. In the event of a defect in material or workmanship, GVF sole responsibility is to the repair or replacement of the defective part and is not responsible for lost time or any other expenses incurred due to lost time.

All OEM items such as Tires, Batteries, Engines and Hydraulic components are warranted by the original equipment manufacturer. GVF controls the installation of these products but not the manufacture; therefore, GVF warranty applies to the proper installation but not the OEM component itself.

Retail Customer Responsibility: It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual to operate, lubricate, maintain, and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is misuse of this equipment. It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.

It is the Retail Customer's responsibility to deliver the product to the authorized GVF dealer, from whom he purchased it, for service or replacement of defective parts, which are covered by warranty. Repairs to be submitted for warranty consideration must be made within 45 days of failure. The Retail Customer is responsible for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.