OPERATIONS-PARTS MANUAL

MSP470A
MECHANICAL-DRIVE

Riding Trowel

allen ENGINEERING CORPORATION
819 South 5th Street
Paragould, AR 72450

053257 - 01/2014

NOTICE

This manual, or a copy of it, must be kept with the machine at all times.
There is a manual storage container located on the machine for your convenience.

053257 - 01/2014

Riding Trowel

OPERATIONS - PARTS MANUAL

This manual covers the products listed below:

Part No.	Description
060900	RIDER MSP470

Allen Products are covered under one or more of the following patent numbers:
U.S. Design Patents: 344,736; 400,542; 400,544; 402,998; 402,999; 403,332; 404,041; 404,042; 410,931; 413,127; 416,564; 465,897; 466,909; 474,203.
U.S. Utility Patents: 5,108,220; 5,238,323; 5,328,295; 5,352,063; 5,405,216; 5,476,342; 5,480,257; 5,480,258; 5,533,831; 5,562,361; 5,567,075; 5,613,801; 5,658,089; 5,685,667; 5,803,658; 5,816,739; 5,816,740; 5,890,833; 5,934,823; 5,967,696; 5,988,938; 5,988,939; 6,019,433; 6,019,545; 6,048,130; 6,053,660; 6,089,786; 6,106,193; 6,857,815; 5,288,166; 6,582,153 B1, 7,108,449; 7,114,876; 7,316,523; 7,690,864 B2
Canadian Patents: 2,039,893.

NOTE: This machine (MSP470) is classified as “Patent Pending”.

First Issue: January 2014 (Amended October 2014: Gen 2)

AEC Manual Part No.: 053257
Printed in U.S.A.

Limited Warranty

LIMITED WARRANTY and LIMITATION OF LIABILITY

Allen Engineering Corporation ("Allen") warrants its products to be free of defects in material or workmanship for the following periods:

A. **New Machines and Parts.....One Year**

Warranty period begins on first day of use by End User. This first day of use is established by the date of a completed Allen Warranty Card or a Bill of Sale to the End User. All warranty is based on the following limited warranty terms and conditions, including the disclaimer of implied warranties and consequential damages.

1. Allen's obligation and liability under this warranty is limited to repairing or replacing parts if, after Allen's inspection, there is determined to be a defect in material or workmanship. Allen reserves the choice to repair or replace.

2. If Allen chooses to replace the part, it will be at no cost to the customer and will be made available to the Allen Distributor, Dealer, or Rental Center from whom the End User purchased the product.

3. Replacement or repair parts, installed in the product, are warranted only for the remainder of warranty period of the product as though they were the original parts.

4. Allen does not warranty engines. Engine warranty claims should be made directly to an authorized factory service center for the particular engine manufacturer.

5. Allen's warranty does not cover the normal maintenance of products or its components (such as engine tune-ups and oil & filter changes). The warranty also does not cover normal wear and tear items (such as belts and consumables).

6. Allen's warranty will be void if it is determined that the defect resulted from operator abuse, failure to perform normal maintenance on the product, modification to product, alterations or repairs made to the product without the written approval of Allen. Allen specifically excludes from warranty any damage to any trowels resulting from an impact to the rotors.

7. Impact damage is not covered under the Allen Gear Box warranty.

8. Allen will pay shop labor on warranty items at the Allen Shop Labor Rate in existence on the date of the warranty claim. An Allen Labor Chart will determine the time allowed to complete a repair and will govern the shop labor hours that will be allowed.

9. Allen will pay freight on warranty replacement parts at worldwide standard ground rates. No warranty replacement parts will be shipped air freight at the expense of Allen. Allen only pays outbound freight charges when sending warranty replacement parts to the customer via ground service. Allen does not pay any inbound freight. However, if Allen determines this to be a warranted item, only then will Allen reimburse the customer for inbound freight at standard ground rates.

10. ALLEN ENGINEERING CORPORATION'S WARRANTY POLICY WILL NOT COVER THE FOLLOWING: TAXES; SHOP SUPPLIES; ENVIRONMENTAL SURCHARGES; AIR FREIGHT; TRAVEL TIME; LOSS OF TIME; INCONVENIENCE; LOSS OF RENTAL REVENUE; RENTAL COSTS OF EQUIPMENT USED TO REPLACE THE PRODUCT BEING REPAIRED; LOSS OF USE OF THE PRODUCT; COMMERCIAL LOSS; OR ANY OTHER CHARGES WHATSOEVER OR ANY LIABILITIES FOR DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE OR DELAY.

11. ALLEN ENGINEERING CORPORATION MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THIS LIMITED WARRANTY IS IN LIEU OF THE WARRANTY OF MERCHANTABILITY AND FITNESS. THERE ARE NO OTHER WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THIS DOCUMENT.

12. No Allen employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Allen Engineering Corporation.

Table of Contents

Table of Contents - Continued

Information Contained in this Manual

This manual provides information and procedures to safely operate and maintain the Allen Machine.

For your own safety and protection from personal injury, carefully read, understand, and observe the safety instructions described in this manual. Keep this manual or a copy of it with the machine at all times.

Always operate this machine in accordance with the instructions described in this manual. A well maintained piece of equipment will provide many years of trouble free operation.

This manual is divided into the following sections:

SECTION 1 SAFETY

SECTION 2 OPERATIONS

SECTION 3 SERVICE

SECTION 4 PARTS

Complete any warranty requirements as specified by the engine manufacturer in their instructions found inside the manual box located on the operator's control panel.

Your engine is not manufactured by Allen Engineering Corporation, Inc, and therefore is not covered under Allen Engineering Corporation, Inc warranty.

Your engine manufacturer should be contacted if you wish to purchase a parts manual or a repair manual for your engine.

Refer to enclosed owners engine manual for complete O&M instructions. See your battery manufacturer for battery warranty.

Dealer Information

Your Dealer has Allen Engineering Corporation trained mechanics and original Allen replacement parts. Always contact the Allen Dealer who sold you this machine for Allen Certified repairs and replacement parts.

Place Allen Dealer information below for future reference.

Dealer Name: _____

Phone #: (____) - ____ - _____

Address: _____

City:_____State:_____ Zip:_____

Salesman: _____Mobile Phone _____

Additional Comments: _____

_____

_____

Ordering Parts

Section 4.0 contains illustrated parts lists for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.

2. Include correct description and part number from the “PARTS” section of this manual.

3. Specify exact shipping instructions, including the preferred routing and complete destination address.

4. DO NOT return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.

5. When placing an order, please contact the AEC dealer nearest you.

NOTE

All information, specifications, and illustrations in this manual are subject to change without notice and are based on the latest information at the time of publication.

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FOLLOW US!!! *@alleneng*

WATCH US!!! *www.youtube.com/AllenMachinery*

Model Number - Serial Number Codes

Manufacturer's Codes:
When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine. The legends below specifically defines each significant character or group of characters of the Model Number and Serial Number codes.

Model Number

MSP 470

- **Series** 470
- **Mechanical Super Professional**

Serial Number
The serial number found on the identification plate is a ten digit format. The model number identifies your machine and will ensure that you receive the correct replacement parts.

Serial Number Example

470 02 13 001

- **Sequence Number**
- **Year**
- **Month**
- **Series** 470

Unit Identification

Unit Identification Plate Location:

An identification plate listing the model number and the serial number is attached to each unit and is located on the bottom left hand corner of the operator control panel. See image below for serial number plate number location. This plate should not be removed at any time.

Please record the information found on this plate below so it will be available should the identification plate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine.

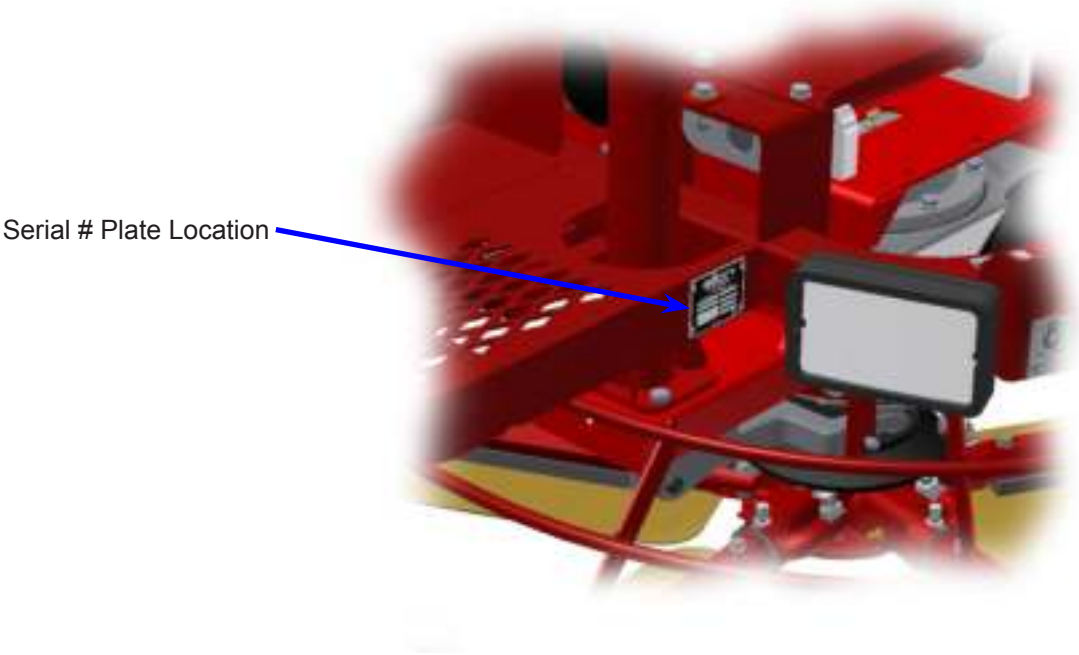
FILL IN FOR FUTURE REFERENCE

Model Number:_____

Serial Number:_____

Date Purchased:_____

Purchased From:_____



Technical Specifications

MODEL	MSP455
Engine	Kubota (44 hp) Turbo Diesel
Dimensions (L x W x H)	101.5 in. x 50.5 in. x 59 3/8 in. (254 x 128 x 151 cm)
Panning Width	97.5 in. (248 cm)
Rotors (Diameter)	46 in. (1,168 mm) - Five Bladed Spider
Maximum Rotor Speed	180 RPM (Variable Speed)
Weight	1,491 lbs. (676 kg)
Steering	Manual
Fuel/Retardant Capacity	6 gal. (22.7 L)

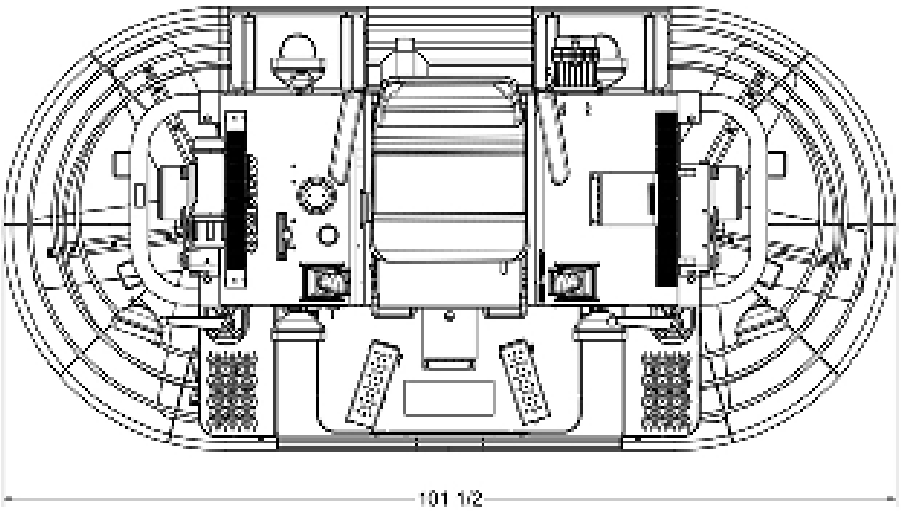
The MSP470 is our newest model in our popular MSP Series. The powerful diesel engine, Super Heavy-Duty Gearboxes and Spiders provide a great weight-to-horsepower performer for larger contractors. The newly designed Allen power transmission system (patent pending) is incorporated into this machine to provide exceptional performance from the engine to the concrete surface.

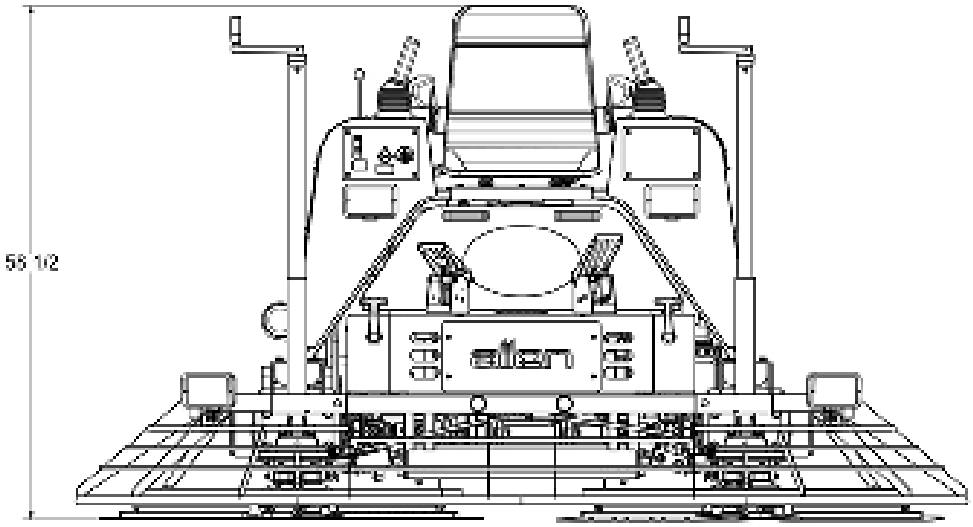
- Adjustable Seat and Arm Rests
- Light Switch, 12 Volt Charger, and Hour Meter in One Convenient Location
- Ergonomic Hydraulic Steering
- Independent Manual Pitch Control
- Detachable Front Access Panels
- Comfort Positioned Pedals
- Raised Operator Platform
- Powered Retardant Spray System
- Variable Speed Torque Converter
- Five-Bladed Spider with Super Heavy-Duty (SHD) Gearboxes
- Six Lights
- Versa Steering Linkage

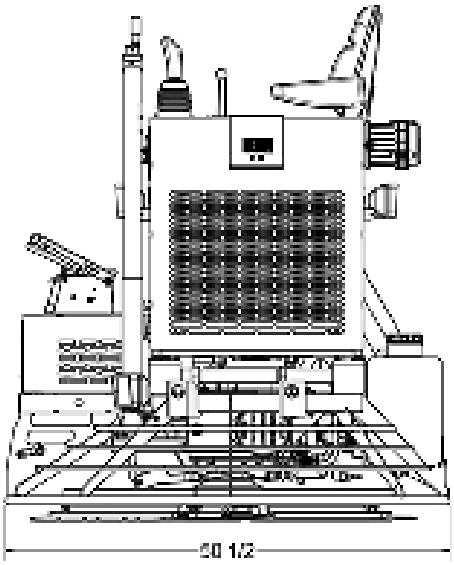
Engine Specifications
44 HP Kubota

Model		V1505-T-E4B
Emission Regulation		Tier 4 / Stage IIIA
Type		Vertical 4-cycle liquid cooled Diesel
Number of Cylinders		4
Bore	mm (in)	78.0 (3.07)
Stroke	mm (in)	78.4 (3.09)
Displacement	L (cu.in)	1.498 (91.41)
Combustion System		IDI
Intake System		Turbocharged
Maximum Speed	rpm	3000
Output: Gross Intermittent	kW	33
	hp	44.3
Direction of Rotation		Counterclockwise Viewed on Flywheel
Oil Pan Capacity	L (gal)	6.7 (1.77)
Starter Capacity	V-kW	12-1.2[US]/12-1.4[EU]
Alternator Capacity	V-A	Dec-40
Length	mm (in)	591.3 (23.28)
Width	mm (in)	433.0 (17.05)
Height	mm (in)	621.0 (24.45)
Dry Weight	kg (lb)	114.0 (251.3)

Dimensional Specifications







DECLARATION OF CONFORMITY

We, **Allen Engineering Corporation (AEC)**

Of **819 South Fifth Street, Paragould, Arkansas, 72451, USA;**
TEL: 870-236-7751, FAX: 870-236-3934

Product
MSP470 RIDING TROWEL SERIES
(description of product)

AEC hereby declares under our sole responsibility that the product identified above complies with the provisions in accordance with Machinery Directive 98/37/EC. AEC has applied the following normative documents:

2000/14/EC	**Noise Emission Of Outdoor Equipment Directive**
EN 294:1992	**Safety Of Machinery-Safety Distance Of Danger Zones**
EN 574:1996	**Safety Of Machinery-Two-hand Control Devices**

The Technical Construction File is maintained at: Allen Engineering Corporation, 819 South Fifth Street, Paragould, Arkansas.

Date Of Issue: **December 5, 2013**
(month/day/year)

Signed: _____ **Date:** 12/5/13
(signature of authorized person) *(month/day/year)*

Jay Allen
President

Signed: _____ **Date:** 12/05/13
(signature of authorized person) *(month/day/year)*

Scott Sugg
Vice President

The Technical Construction file is maintained at:

Allen Engineering Corporation
819 South 5th St.
Paragould, AR 72450
Telephone: 800-643-0095
Facsimile: 800-643-0097

The authorized representative is:

ab lin-pro
Mr. Thomas Voeler
Femvägsskälet 3
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Sweden
Tel: +4631694910
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Fax: +4631298876
Email: tv@lin-pro.se

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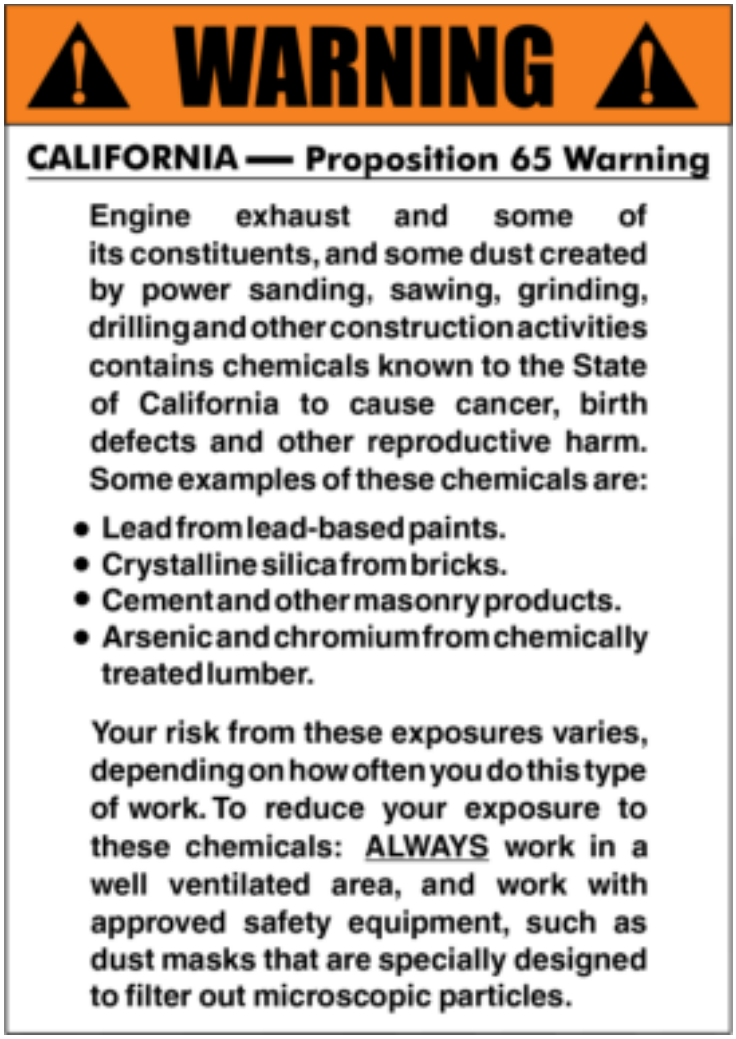
Section 1
SAFETY

State Regulations
Proposition 65 Warning



⚠ WARNING

RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm. If you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufacturers or suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH/MSHA for the materials being used.

⚠ WARNING

SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica. Silica is a basic component of sand, quartz, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory diseases, including silicosis. In addition, California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

SECTION 1 SAFETY

Safety Information

Do not operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.

SAFETY NOTES

The four safety notes shown below will inform you about potential hazards that could injure you or others. The safety notes specifically address the level of exposure to the operator and are preceded by one of four words: DANGER, WARNING, CAUTION or NOTICE.

Indicates a hazardous situation which, if not avoided, **will** result in death or serious injury.

Indicates a hazardous situation which, if not avoided, **could** result in death or serious injury.

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

Addresses practices not related to personal injury.

Safety Symbols

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety notes.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
 	Rotating parts/crush hazards
	Pressurized fluid hazards
	Hydraulic fluid hazards

SECTION 1 SAFETY

General Safety

● **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.

● **ALWAYS** avoid wearing jewelry or loose fitting clothes that may snag on the controls or moving parts as this can cause serious injury.

● **NEVER** operate this equipment when not feeling well due to fatigue, illness or when under medication.

● **NEVER** operate this equipment under the influence of drugs or alcohol.

● **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

● No one other than the operator is to be in the working area when the equipment is in operation.

● **DO NOT** use the equipment for any purpose other than its intended purposes or applications.

● This equipment should only be operated by trained and qualified personnel 18 years of age and older.

● Whenever necessary, replace nameplate, operation and safety decals when they become difficult to read.

● AEC does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.

● **NEVER** use accessories or attachments that are not recommended by AEC for this equipment. Damage to the equipment and/or injury to user may result.

● **ALWAYS** know the location of the nearest fire extinguisher.

● **ALWAYS** know the location of the nearest first aid kit.

● **ALWAYS** know the location of the nearest phone or keep a phone on the job site. Also, know the phone numbers of the nearest ambulance, doctor and fire department. This information will be invaluable in the case of an emergency.

DANGER

● Engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause death if inhaled.

● The engine of this equipment requires an adequate free flow of cooling air. never operate this equipment in any enclosed or narrow area where free flow of the air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.

● **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing severe bodily harm or even death.

WARNING

● If applicable, never use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgable physician immediately or severe injury or death can occur.

● **ALWAYS** keep clear of rotating or moving parts while operating the riding tr

● **NEVER** disconnect any emergency or safety devices. These devices are intended for operator safety. Disconnection of these devices can cause severe injury, bodily harm or even death. Disconnection of any of these devices will void all warranties.

CAUTION

● **NEVER** allow passengers or riders on the riding trowel during operation.

● **NEVER** lubricate components or attempt service on a running machine.

General Safety (cont'd)

NOTICE

● **ALWAYS** keep the machine in proper running condition.

● Fix damage to machine and replace any broken parts immediately.

● **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.

⚠ WARNING

● **DO NOT** place hands or fingers inside engine compartment when engine is running.

● **NEVER** operate the engine with heat shields or guards removed.

● Keep fingers, hands hair and clothing away from all moving parts to prevent injury.

● **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the screed.

⚠ CAUTION

● **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing equipment.

NOTICE

● **NEVER** run engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service air filter frequently to prevent engine malfunction.

● **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.

DANGER

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

● **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.

● **ALWAYS** use extreme caution when working with flammable liquids.

● **DO NOT** fill the fuel tank while the engine is running or hot.

● **DO NOT** overfill tank, since spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.

● Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.

● **NEVER** use fuel as a cleaning agent.

● **DO NOT** smoke around or near the equipment. Fire or explosion could result from fuel vapors or if fuel is spilled on a hot engine.

DANGER

● **DO NOT** drop the battery. There is a possibility that the battery will explode.

● **DO NOT** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases and liquids come into contact with a flame or spark, an explosion could occur.

WARNING

● **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin.

● Use well-insulated gloves when picking up the battery.

● **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.

● **DO NOT** charge battery if frozen. Battery can explode. When frozen, warm the battery to at least 61°F (16°C).

General Safety (cont'd)

● **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gases.

● If the battery liquid (dilute sulfuric acid) comes into contact with clothing or skin, rinse skin or clothing immediately with plenty of water.

● If the battery liquid (dilute sulfuric acid) comes into contact with eyes, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.

⚠ CAUTION

● **ALWAYS** disconnect the negative battery terminal before performing service on the equipment.

● **ALWAYS** keep battery cables in good working condition. Repair or replace all worn cables.

● Side slope operation is not permitted.

● Walk around the riding trowel before starting it to see if any items are worn, damaged, leaking, etc. that may make the riding trowel dangerous to operate.

● Stop and inspect the equipment if you strike an object. If necessary, make repairs before restarting.

● **ALWAYS** check that all controls are functioning properly immediately after start-up!

● **DO NOT** operate machine unless all controls operate correctly.

This decal notates special safety equipment that is required to operate this machine.

This decal notates the pinch point locations on this machine.

This decal notates the lifting points on this machine.

This decal indicates that this machine can start fires to it's surroundings due to sparks from the exhaust.

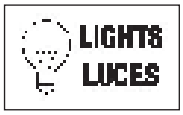
This decal indicates a hot surface and warns personnel not to touch.

Safety Labels and Decals (cont'd)

This decal notates that lifting a trowel with clip on style pans attached is prohibited. Use only safety catch pans.

This decal notates that this equipment was proudly manufactured in the United States of America.

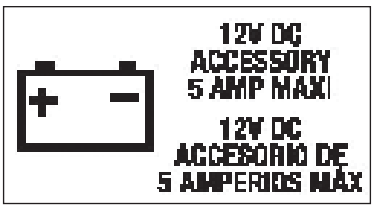
This decal notates the location of the light switch on this machine.



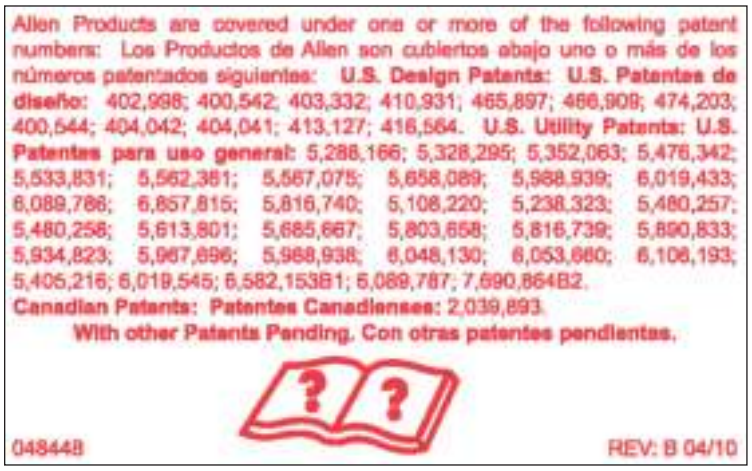
This decal notates that the thrust bearings must be greased daily.

This decal notates that this product was made at the Allen Engineering Corporation manufacturing facilities in Paragould, Arkansas.

This decal notates the location of the 12V accessory port.



This decal notates that this product is covered under one or more patents.



This decal notates the model number and series number of this machine.

This decal notates the location of where to put hand tools on the machine.

Safety Labels and Decals (cont'd)

This decal notates the location of where the operations and parts manuals are.

This decal illustrates Allen Concrete Equipment.

⚠ CAUTION

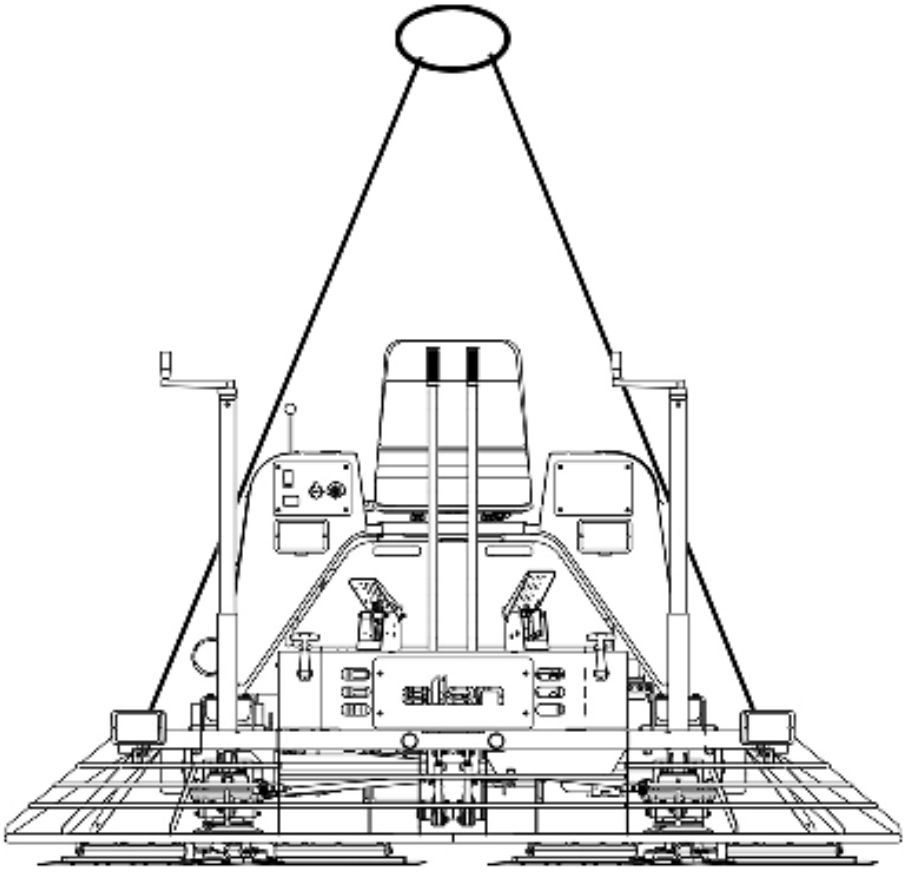
● When lifting the riding trowel, all personnel must be clear of the machine.

● **DO NOT** stand near or under the machine while it is being lifted.

Lifting instructions using a hoist:

● Place slings, chains or hooks through each lifting eye on the machine. Use a sling or chains with a minimum length of 2 meters (5 feet) on each leg, connected to a central lifting device. Ensure that all lifting devices have sufficient weight-bearing capacity.

● **ALWAYS** shutdown engine before transporting.



NOTE: Figure for illustration purposes only.

1.4 Transportation Safety (cont'd)

● Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer "gross vehicle weight rating."

● **ALWAYS** inspect the hitch and coupling for wear. Never tow a trailer with defective hitches, couplings, chains, etc.

● Check the tire air pressure on both towing vehicle and trailer. Trailer tires should be inflated to 50 psi cold. Also check the tire tread wear on both vehicles.

● **ALWAYS** make sure the trailer is equipped with a safety chain.

● **ALWAYS** properly attach trailer's safety chains to towing vehicle.

● **ALWAYS** make sure the vehicle and trailer directional, backup, brake and trailer lights are connected and working properly.

● DOT Requirements include the following:
- Connect and test electric brake operation.
- Secure portable power cables in cable tray with tie wraps.

● The maximum speed for highway towing is 55 MPH unless posted otherwise. Recommended off-road towing is not to exceed 15 MPH or less depending on type of terrain.

● Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve towing.

● Avoid sharp turns to prevent rolling.

● Trailer should be adjusted to a level position at all times when towing.

● Raise and lock trailer wheel stand in up position when towing.

● Place chock blocks underneath wheel to prevent rolling while parked.

● Place support blocks underneath the trailer's bumper to prevent tipping while parked.

● Use the trailer's swivel jack to adjust the trailer height to a level position while parked.

Section 2
OPERATIONS

SECTION 2 OPERATIONS

Pre-Operating Instructions

Before operation each day ensure the following:

• All guards, side screens and panels are in place.

• All safety and information signs are in place and legible.

• Engine oil levels are correct.

• Hydraulic oil levels are correct.

• Check battery level

• Check all operating controls for proper operation and adjustment.

• Check speed control operation before and after starting engine for proper operation.

• Gearbox oil level. Add oil as required.

• The steering, left and right.

Note: If there is any indication that faulty equipment exists, shutdown safely, inform the proper authority and **DO NOT** operate the riding trowel until the problem has been fixed.

• Remove loose objects that could interfere with operation.

Before starting riding trowel, locate and identify the operational and visual controls pertaining to the operation of the riding trowel.

1) Sit down correctly on the riding trowel seat. DO NOT attempt to start the riding trowel without an operator in the seat. This machine is equipped with an automatic shut down system via a kill switch pedal.

2) Turn key counter-clockwise until the glow plug light goes off then clockwise until the engine engages and starts.

NOTE **To much throttle during start-up will flood the engine.**

3) Turn key to the run position and allow spring back. Allow engine to warm up before operating trowel.

NOTE Operating the starter for more than 5 seconds can damage the starter or engine. If engine fails to start release the switch and wait 15 seconds before operating starter again.

Cold Start-up Procedures

When ambient temperatures are below 60°F (16°C) cold weather startup procedures must be followed before bringing machine into maximum engine RPM and rotor speed. If the procedure is not followed, damage could occur which will void the warranty. See below for startup procedure.

When ambient temperatures are below 60°F (16°C) run engine at 1/4" throttle. There is an arrow (A) located on a decal showing where the throttle lever's front edge should be located. Engage the rotors by pressing on the right foot pedal for approximately 5 to 7 minutes to allow the engine system time to adequately warm up before operation.

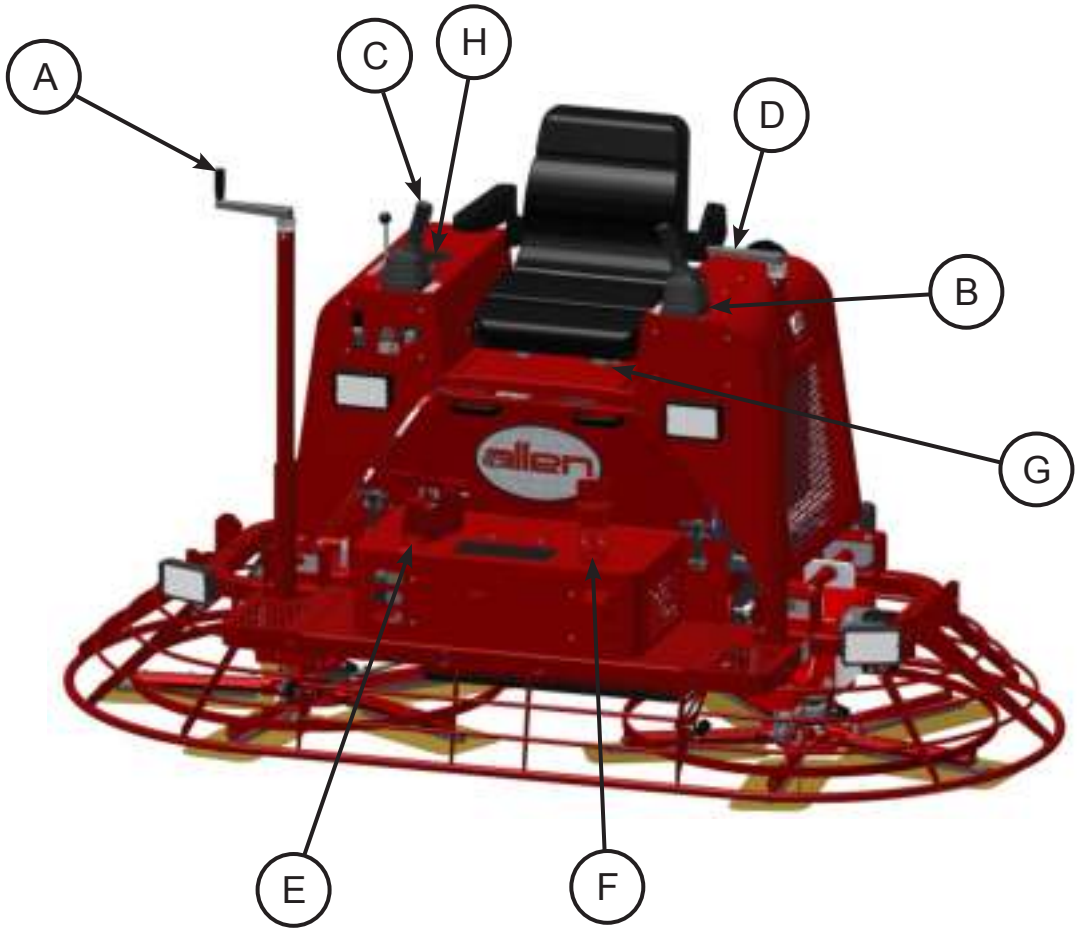
SECTION 2 OPERATIONS

Operating Instructions

To utilize your Allen Engineering MSP470 Rider to its fullest capacity the machine should be driven in the direction the operator is facing. This will finish the widest possible area while giving the operator an excellent view of the slab surface about to be troweled. When the machine reaches the end of the slab make a 180 degree turn and repeat the straight line of direction to the other end of the slab. To familiarize a new operator with the riding trowel the following steps should be taken.

Location of all Operating Controls

[A]	Right Pitch Control
[B]	Joystick (Forward & Reverse)
[C]	Joystick (Left & Right, Forward & Reverse)
[D]	Left Pitch Control
[E]	Right Foot Pedal
[F]	Left Kill Switch
[G]	Seat Adjustment
[H]	Cup Holder



With the operator in the seat, show them the functions of the joysticks [B] and [C] and how to start the machine.

A hard level concrete slab with water on the surface is an ideal place for an operator to practice with the machine. For practice pitch the blades up approximately 1/4 inch on the trailing edge. Start by making the machine hover in one spot and then practice driving the machine in a straight line and making 180 degree turns. Best control is achieved at full engine RPM.

⚠ CAUTION

After starting engine fully engage the throttle. This allows the engine to warm up quicker and also engages the torque converter. Once the operator presses the right pedal the machine's rotors will begin turning.

Stopping The Riding Trowel

To stop the trowel's movement, let go of the joysticks [B] and [C]. They will return to their neutral position. Also release pressure on the right foot pedal [E].

⚠ CAUTION

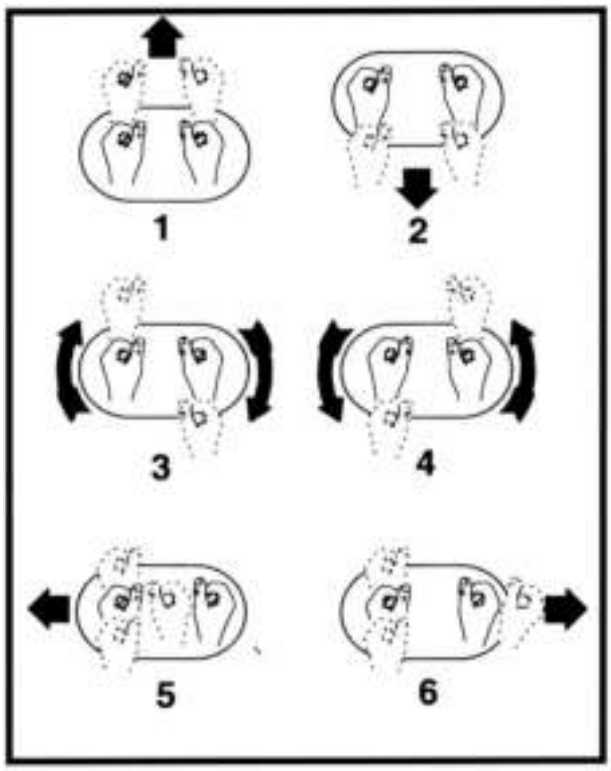
This machine has a kill switch mechanism installed in the left foot pedal. If in need of an emergency stop, simply lifting the foot off of the pedal will turn the engine off completely.

Operating Instructions - cont'd

Steering The Riding Trowel

A slight "feathering motion" forward and backward with the left hand joystick is required to move the machine in a straight path to the left or right while operating the right hand joystick.

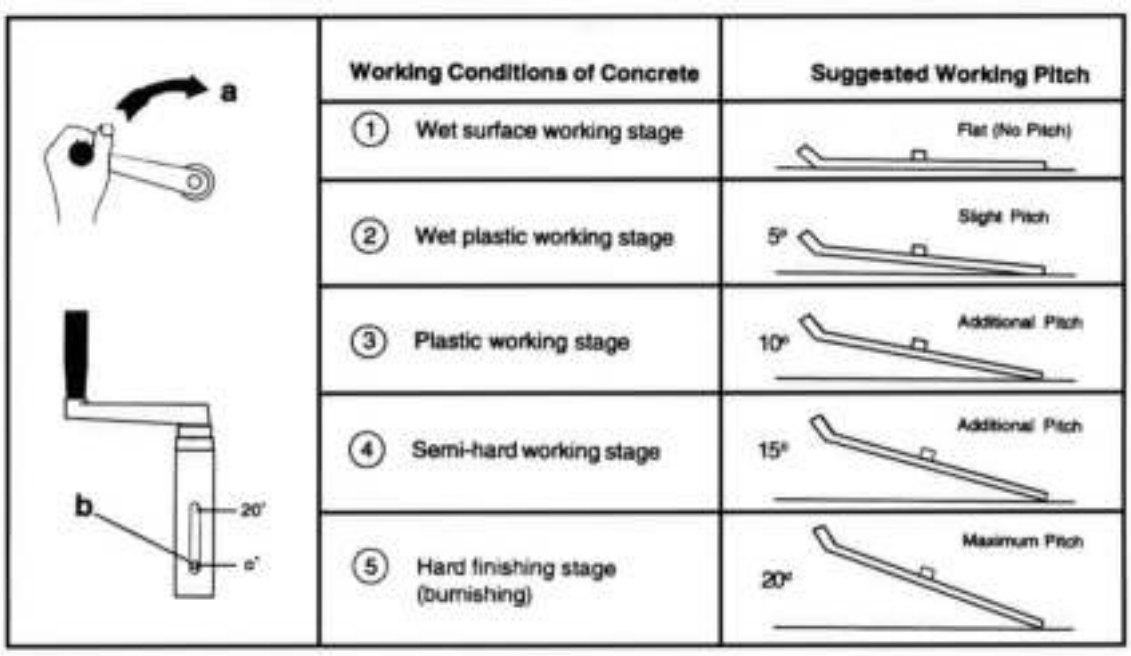
Position	Action
1	Forward
2	Reverse
3	Rotate clockwise
4	Rotate counter clockwise
5	Left sideways
6	Right sideways



Pitch Adjustment

Different pitch angles are needed as you work the different stages of the concrete. Refer to figure below. When changing or setting pitch (angle of trowel blades), slow the machine down, set the desired degree of pitch on the left side of the machine and then adjust the right side to match.

To increase the pitch, turn the pitch control clockwise "a" use the pitch indicator "b" to adjust pitch equally on both right and left trowel blades.



Notes

OUR MISSION STATEMENT

Our Mission is to provide superior quality products (manufactured in a safe and efficient environment by highly trained and dedicated personnel), on-time deliveries, with reactive and knowledgeable customer service.

OUR QUALITY POLICY

The Allen Engineering Team is fully committed to exceeding customer expectations for the quality of the products and services provided through the continuous improvement process of reducing waste, defects, and variability in everything we do.

OUR VISION

Our Vision is to be a world-class manufacturer of concrete placing and finishing equipment.

Section 3
SERVICE

SECTION 3 SERVICE

Maintenance Instructions

Maintenance described in this section represents minimum requirements for continuous satisfactory operation of the machine.

Because improperly maintained machines are hazardous, it is extremely important that only qualified mechanics perform maintenance work.

It is imperative that only genuine AEC parts are used if replacement is needed as substituted parts in critical areas may place the operator at risk and impeed correct machine performance.

It is recommended that a regular maintenance schedule be followed for mechanical adjustments as well as for lubrication.

Use a preventative maintenance program to catch and correct many serious problems before they occur. The preventative maintenance schedule contained herein gives a daily, weekly, monthly, semi-annually, annually, and break-in 100 hours minimum requirement to keep your riding trowel running efficiently for years. The lubrication chart contained herein is one part of riding trowel preventative maintenance.

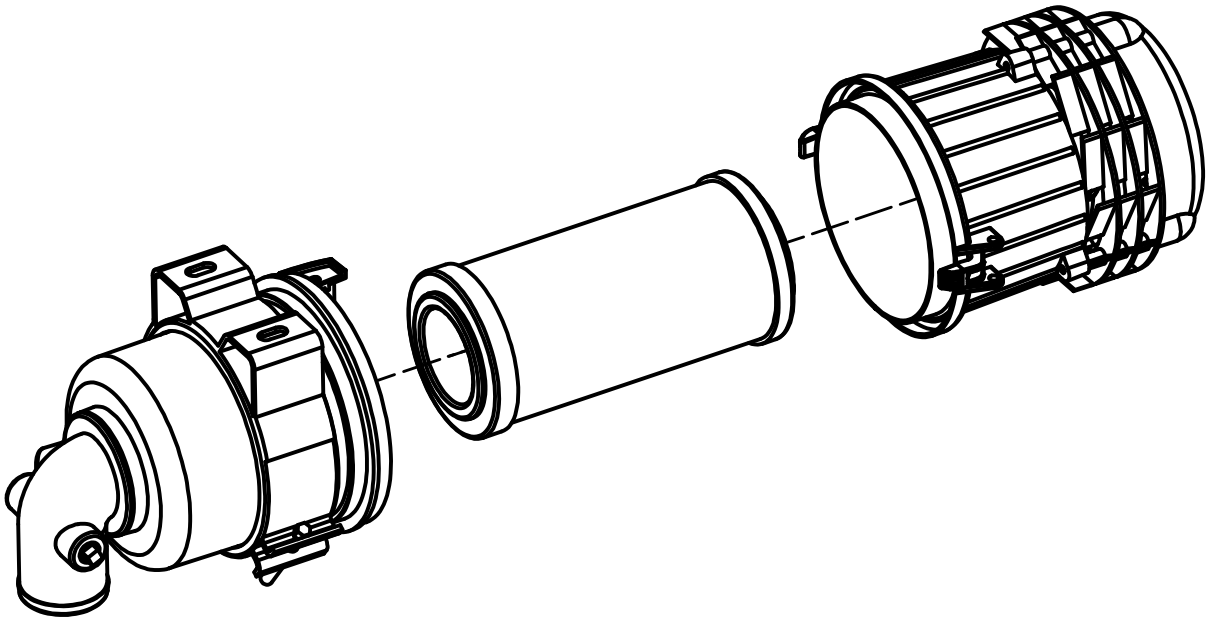
Because regular maintenance cannot be controlled by the manufacturer or by the distributor, it must ultimately be the responsibility of the owner.

Your AEC dealer stands ready to assist in the event of operational difficulties. However, most adjustments and/or repair can be readily performed by the user.

The instructions provided in this section will facilitate the maintenance of the AEC equipment to operate at peak efficiency.

Pre-Cleaner Maintenance Procedure

This machine is equipped with a large capacity, dual element air filter.



When should you change an air filter? Many people believe that if a filter looks dirty it is no longer working and should be changed. As stated above, filters need dirt to work properly. The key is knowing when the filter is so dirty that to much energy is required by the engine to draw in air that it no longer functions at it's designed performance level.

Should you remove a filter to examine it? NO, never remove a filter until you are sure it needs to be replaced. Most dust and dirt that enters your engine comes from over servicing the air filter. When an air filter is removed, it's seal is broken and dust and dirt that is in the air filter canister, now has a clear path into your engine.

Use a Dust Load Indicator (DLI) to tell you when to change the filter. Dust Load Indicators take the guess work out of air filter changes. The DLI is a vacuum sensitive device that "pops" of and shows you red when it is time to change filters. If it is not red, don't open the filter and allow more dirt to enter into the engine. If it is red, carefully remove the filter cover and immediately vacuum the canister to remove loose dirt. Then slowly remove the filter being careful not to disturb the dirt that may have become caked around the seal of the filter. Again vacuum the canister, and then wipe the sealing area with a damp cloth to insure no dirt can get into your engine. Replace the filter immediately with either a new one or one that has been properly cleaned.

How do you clean an air filter? **NEVER use high powered air or "bang" it against something hard!** By doing so you can tear the paper or damage the sealing area and thus render the filter worse than useless. Paper filters can be cleaned by carefully vacuuming their surface with a soft brush and thus remove loose dust.

SECTION 3 SERVICE

Kubota Engine Maintenance Schedule

Hour Meter Reading: Check or Change Every Interval Shown Below	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	After Purchase 1000	1st Yr	2nd Yr
Engine oil & filter change	x			x				x				x				x			x		
Transmission fluid change	x					x						x						x			
Hyd. Oil filter cleaning	x					x						x						x			
Greasing ALL zerks		x		x		x		x		x		x		x		x		x			
Clean air cleaner element		x		x		x		x		x		x		x		x		x			
Clean radiator screen and check coolant level	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Fan belt tension			x			x			x			x			x			x			
Fuel filter element						x						x					x				
Valve clearance check																x					
Check all safety switches for correct operation	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Replace cooling system Anti-freeze																				x	x
Replace air cleaner																	x			x	x
Check fuel lines																				x	x
Check radiator hoses																				x	x

When performing maintenance on the engine, follow all safety messages and rules for safe operation stated at the beginning of this manual.

See the engine manual supplied with your machine for appropriate engine maintenance schedule and troubleshooting guide for problems.

WARNING

Accidental starts can cause severe injury or death.

ALWAYS place the ignition switch in the OFF position before performing any maintenance.

Disconnect negative battery cable from battery before servicing.

ALWAYS allow the engine to cool before servicing. NEVER attempt any maintenance work on a hot (muffler, radiator, etc.) power unit.

WARNING

Certain maintenance operations or machine adjustments require specialized knowledge and skill. Attempting to perform maintenance operations or adjustments without the proper knowledge, skills or training could result in equipment damage or injury to personnel. If in doubt, consult your dealer.

Engine Oil Level Check

• ALWAYS check the engine oil dipstick before using the riding trowel. At a minimum check engine oil once per day. Follow the Maintenance and Lubrication Chart contained herein.
• ALWAYS use a good quality engine oil.
• The engine oil fill is the same as the oil dipstick hole and is located on the engine block opposite the crankcase drain hose and plug.
• Use oil grades appropriate to the surrounding temperature range as shown below. See **GRADE OF OIL CHART** under **CHANGING ENGINE OIL** section below.
• Remove engine oil dipstick to access oil fill hole. To fill engine with oil use a long funnel to avoid spilling or use an oil can filled with the proper weight small engine oil and squirt oil directly into fill hole. Check oil level with dipstick. Fill the crank case to the full mark on the dipstick. **DO NOT** overfill.
• Replace dipstick.

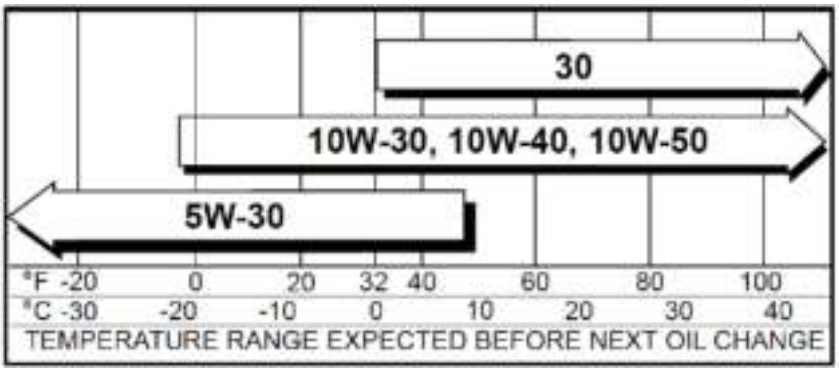
Change Engine Oil

NOTE Important: Engine oil is best drained when the engine is warm. Warm oil flows freely and carries away more impurities than cold oil.

Note: Change engine oil every **25 hours** of operation. On a new engine, change oil after the first **5 hours** of operation.

Note: Trowel must be on a level surface when changing and checking oil.

Note: Viscosities shown in the chart below may be used when the average temperature in your area is within the indicated range.



Periodic Maintenance Schedule

Maintenance Schedule					
Item	**Daily**	**Weekly**	**Monthly**	**Annually**	**100 Hours**
Check external hardware	✓				
Apply grease to thrust bearings	✓				
Check all operational controls	✓				
Tighten all bolts and nuts.			✓		
Grease steering assembly heim joints			✓		
Tighten any loose bolts, nuts, etc					✓
Inspect visually for loose or missing parts	✓				
Wash wet concrete of machine	✓				
Clean fuel sediment bowl		✓			
Inspect battery (fill with water if needed)		✓			
Change gearbox oil				✓	
Inspect drive belts			✓		
Check all adjustments					✓
Change the engine oil				✓	
Check air cleaner element		✓			
Thoroughly clean machine				✓	

PRIMARY AIR CLEANER ELEMENT
PART #: P822686

ENGINE OIL FILTER
PART #: 16271-32090

ENGINE FUEL FILTER
PART #: 24 050 13

HYDRAULIC OIL FILTER
PART #: 039664

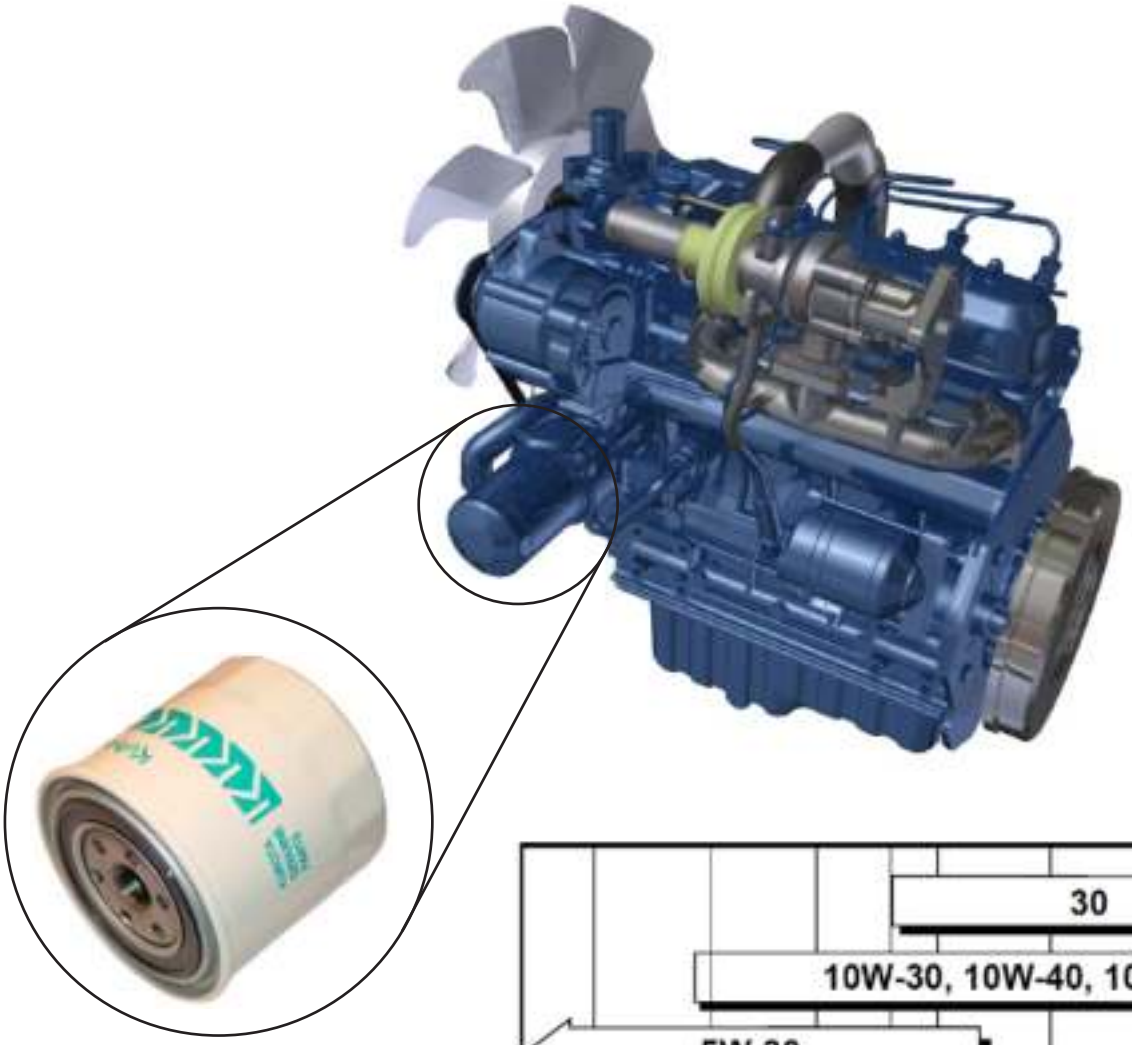
Engine Oil and Oil Filter

1. Refer to the chart on page 3-4 for engine oil change maintenance.

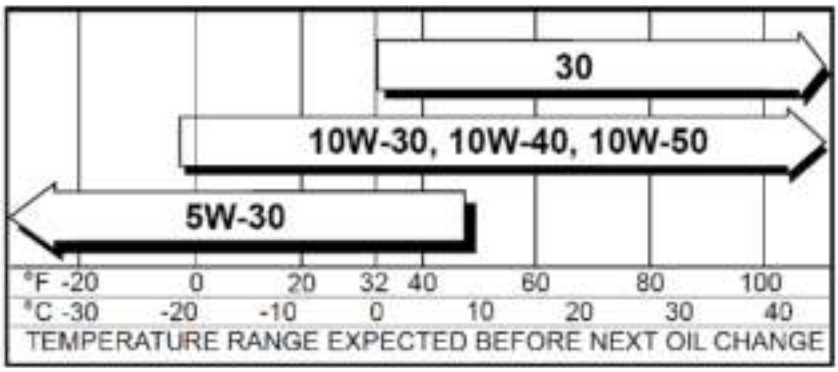
2. Remove the oil filler cap and fill engine crankcase with recommended type oil as listed in the table below. Fill to the upper limit of dipstick.

3. Crankcase oil capacity with oil filter replacement is 5.1L (1.35 Gal).

4. Refer to your engine manual for specific details about oil changing procedures.



16271-32090



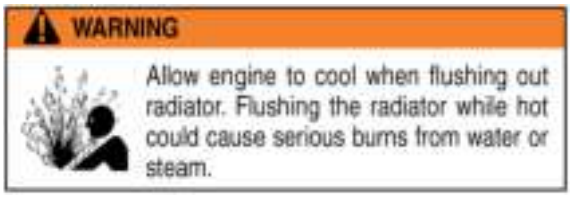
Engine Fuel Filter

Refer to the chart on page 3-4 for engine fuel filter change schedule. Refer to your engine manual for specific details to perform this operation.

Check the oil and fuel lines and connections regularly for leaks or damage. Repair or replace as necessary.

Replace the oil and fuel lines every two years to maintain the line's performance and flexibility.

Radiator/Cooling System



1. Check and clean radiator fins.
2. Check cooling water.
3. Check radiator hoses for fatigue or cracking.
4. Check radiator cap seal.

Refer to your engine manual for additional information.

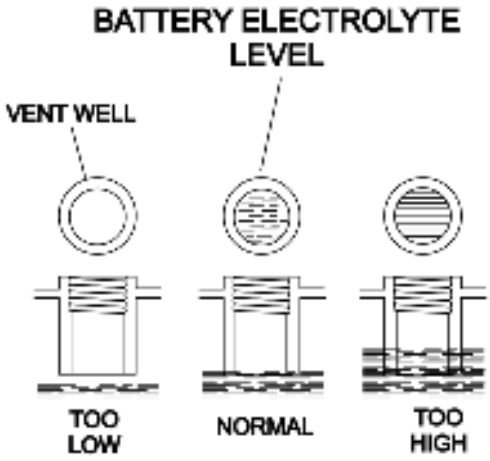
Battery and Charging System

WARNING

Flammable, explosive gas (produces hydrogen gas while charging or during operation). Keep area around battery well ventilated and keep from any fire source.

Battery electrolyte contains corrosive, toxic chemical (dilute sulfuric acid). Avoid contact with eyes and skin. **ALWAYS** wear eye protection and rubber gloves. If your clothing or skin comes into contact with battery acid, immediately wash off with running water and get medical attention.

Shock or fire due to electric short-circuit. Disconnect battery cables before inspecting electrical system and never "spark" battery terminals to test for charge.



Mishandling of the battery shortens its service life and adds to maintenance cost.

1. Check and clean battery terminals for corrosion often.

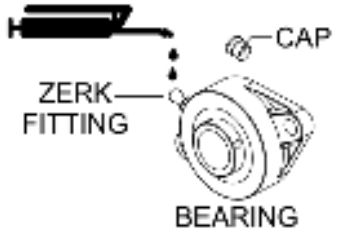
2. Check the battery regularly and make sure that each electrolyte level is to the bottom of the vent well. If necessary, add only distilled water in a well ventilated area. Never operate or recharge without sufficient fluid in the battery.

3. Never attempt to charge a battery that is frozen. The battery can explode unless first allowed to thaw.

4. **ALWAYS** be sure that the battery cables are properly connected to the battery terminals as shown below. Generally the **RED** cable will be connected to the positive terminal of the battery, and the **BLACK** cable will be connected to the negative terminal of the battery.

5. Disconnect the negative terminal (-) of the battery during storage. If unit will be stored where ambient temperature will drop to -15° C or less, remove and store battery in a warm, dry place.

Driveline bearings require lubrication daily. Lubricate all bearing grease fittings with EP3 grease or equivalent.



NOTICE

Failure to lubricate bearing grease fittings daily will cause rotation of driveshafts to stiffen. To prevent contamination of the bearing, always insert cap onto zerk fitting.

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Hydraulic Filter Replacement

NOTE

Always check the filter indicator gauge before operating the riding trowel. When the gauge shows to be in the red, the filter needs to be replaced immediately to prevent damage to the hydraulic system due to contaminants in the system.

To replace the filter, follow the steps below.

STEP 1: Remove the fasteners that hold the filter head in place. Located on top of the hydraulic tank under the foot riser platform.

STEP 2: Remove the dirty filter element and replace with a new filter AEC Part number **039664**.

STEP 3: Reinstall filter head assembly to the top of the tank.

STEP 4: Check the hydraulic oil level and add oil if necessary.

Troubleshooting

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Engine does not start, or is difficult to start	Battery is discharged	- Add battery fluid - Charge the battery - Replace the battery	
		Battery cable is disconnected	- Connect battery cable	
		Blown fuse	- Replace fuse	
		Bad connection or breakage in the wiring	- Contact your AEC dealer	
		Out of fuel	- Fill fuel	
		Air is in fuel	- Contact your AEC dealer	
		Engine fouled	- Wait a while and try starting again	
		Insufficient or wrong oil	- Fill or change oil	
		Dirty or damaged spark plug	- Clean or replace spark plug	
		Contamination in fuel system	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Engine stalls	Out of fuel	- Fill fuel	
		Cold engine	- Warm up the engine	
		Other (other than above)	- Contact your AEC dealer	
	Engine stops abruptly	Out of fuel	- Fill fuel	
		Piston siezure due to insufficient or bad oil	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Engine does not stop	Electrical malfunction	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Idling is not stable	Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Other (other than above)	- Contact your AEC dealer	
	Poor power or acceleration	Bad fuel	- Change fuel	
		Wrong oil (improper viscosity)	- Change to suitable oil	
		Accelerator (throttle) is not properly adjusted	- Contact your AEC dealer	
		Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Excessive load	- Reduce load	
		Loose drive belt	- Adjust	
		Other (other than above)	- Contact your AEC dealer	
	Irregular noise or vibration from or around the engine		- Contact your AEC dealer	
	Excessive oil consumption		- Contact your AEC dealer	
	Engine overheats	Insufficient amount of engine oil	- Fill oil	
		Cooling fan is clogged or blocked	- Clean	
		Other (other than above)	- Contact your AEC dealer	
	Excessive fuel consumption	Clogged air cleaner	- Clean or replace air cleaner	
		Other (other than above)	- Contact your AEC dealer	

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Black smoke comes out of exhaust	Bad fuel	- Change fuel	
		Clogged air cleaner	- Clean or replace the air cleaner	
		Choke is not fully open	- Open the choke fully	
		Other (other than above)	- Contact your AEC dealer	
	White or blue smoke comes out of exhaust	Engine oil level is too high	- Adjust the oil level	
		Other (other than above)	- Contact your AEC dealer	
Safety Devices	Lamp does not light	Blown bulb	- Replace	
		Blown fuse	- Replace	
		Other (other than above)	- Contact your AEC dealer	
Hydraulic System	Pump does not work	Insufficient or deteriorated hydraulic fluid	- Add or change fluid	
		Other (other than above)	- Contact your AEC dealer	

SECTION 3 SERVICE

Belt Tensioning

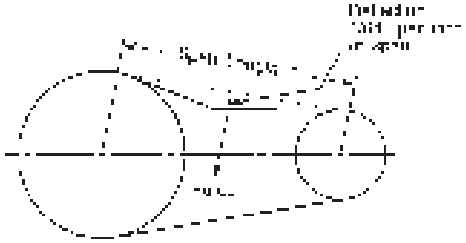
These tolerances are for reference only. For fixed center drive applications and special tolerances, contact Gates Power Transmission Product Application.

Stock Belt Center Distance Tolerances					
Belt Length		(mm) **(in)**	**Center Distance Tolerance**		(mm) **(in)**
over 127 **5**	to	254 **10**	± 0.20 **.008**		
over 254 **10**	to	381 **15**	± 0.23 **.009**		
over 381 **15**	to	508 **20**	± 0.25 **.010**		
over 508 **20**	to	762 **30**	± 0.30 **.012**		
over 762 **30**	to	1016 **40**	± 0.33 **.013**		
over 1016 **40**	to	1270 **50**	± 0.38 **.015**		
over 1270 **50**	to	1524 **60**	± 0.41 **.016**		
over 1524 **60**	to	1778 **70**	± 0.43 **.017**		
over 1778 **70**	to	2032 **80**	± 0.46 **.018**		
over 2032 **80**	to	2286 **90**	± 0.49 **.019**		
over 2286 **90**	to	2540 **100**	± 0.52 **.020**		
over 2540 **100**	to	2794 **110**	± 0.54 **.021**		
over 2794 **110**	to	3048 **120**	± 0.56 **.022**		
over 3048 **120**	to	3302 **130**	± 0.58 **.023**		
over 3302 **130**	to	3556 **140**	± 0.60 **.024**		
over 3556 **140**	to	3810 **150**	± 0.63 **.025**		
over 3810 **150**	to	4064 **160**	± 0.66 **.026**		
over 4064 **160**	to	4318 **170**	± 0.69 **.027**		
over 4318 **170**	to	4572 **180**	± 0.72 **.028**		
over 4572 **180**			add ± .03 **.001** every .254 **10**	for increment	

Standard Belt Tensioning Procedure
When installing a Gates belt:

A. Be sure it is tensioned adequately to prevent tooth jumping (ratcheting) under the most severe load conditions which the drive will encounter during operation.
B. Avoid extremely high tension which can reduce belt life and possibly damage bearings, shafts and other drive components.

The proper way to check belt tension is to use a tension tester. Gates has a variety of tension testers, ranging from the simple spring scale type tester to the sophisticated Sonic Tension Meter. The spring scale type tester is used by measuring how much force is required to deflect the belt at the center of its span by a specified distance (force deflection method), as shown in the sketch below.



The Sonic Tension Meter measures the vibration of the belt span and instantly converts the vibration frequency into belt static tension (span vibration method).

When you wish to use a numerical method for calculating recommended belt installation tension values, the following procedure may be used.

STEP 1: Calculate the required base static installation tension.

Use Formula 14 to calculate the required base static installation tension.

Formula 14

$$T_{st} = \frac{20HP}{S} + mS^2$$

Where: T_{st} = base static installation tension, pounds
HP = Horsepower
$S = \frac{PD \times RPM}{3820}$
m = Value from Table 10
PD = Sprocket Pitch Diameter, inches
RPM = Revolutions per minute of same sprocket

Table 10

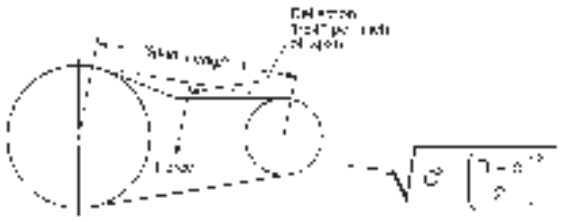
Pitch	Belt Width	m	Y	Minimum T_{st} (lb) per span
8mm	12mm	0.33	43.83	28
	21mm	0.57	76.70	49
	36mm	0.97	131.49	84
	62mm	1.68	226.45	145
14mm	20mm	0.92	134.57	119
	37mm	1.69	248.95	220
	68mm	3.11	457.52	405
	90mm	4.12	605.55	536
	125mm	5.72	841.04	744

Because of the high performance capabilities of PowerGrip belts, it is possible to design drives that have significantly greater load than are necessary to carry the actual design load. Consequently, Formula 14 can provide Tst values less than are necessary for the belt to operate properly, resulting in poor belt performance and reduced service life. If a more appropriately sized drive cannot be designed, minimum recommended Tst values are provided in Table 10 to assure that the belts function properly when lightly loaded.

Always use the greater T_{st} value; i.e., from T_{st} Formula 14 or Table 10.

NOTE: When applying static belt tension values directly, multiply the required base static installation tension (T_{st}) calculated in Formula 14 by the following factors:

For New Belts:
Minimum Static Tension = Base Static Tension X 1.1
Maximum Static Tension = Base Static Tension X 1.2
For Used Belts:
Minimum Static Tension = Base Static Tension X 0.8
Maximum Static Tension = Base Static Tension X 0.9

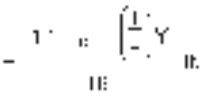


STEP 2: Calculate the minimum and maximum recommended deflection forces.

A. Measure the span length of your drive (see sketch).
B. New belt minimum recommended force:

Formula 15

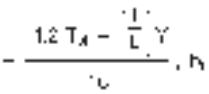
deflection force, Min



C. New belt maximum recommended force:

Formula 16

deflection force, Max.



Where:
T_{st} = Base Static tension, lbf
t = span length, inches
L = belt pitch length, inches
Y= constant from Table 10

USED BELT NOTE: For re-installation of a used belt, a recommended tension of 0.8 T_{st} to 0.9 T_{st} value should be used in calculating the deflection forces, instead of the 1.1 T_{st} to 1.2 T_{st} shown for new belts.

STEP 3: Applying the tension.

Force deflection tension method

A. At the center of the span (t) apply a force perpendicular to the span large enough to deflect the belt on the drive 1/64 inch per inch of span length from its normal position. One sprocket should be free to rotate. Be sure the force is applied evenly across the entire belt width. If the belt is a wide synchronous belt, place a piece of steel or angle iron across the belt width and deflect the entire width of the belt evenly.

B. Compare this deflection force with the range of forces calculated in Step 2.
1. If it is less than the minimum recommended deflection force, the belt should be tightened.
2. If it is greater than the maximum recommended deflection force, the belt should be loosened.

Span vibration tension method

The Sonic Tension Meter detects the vibration frequency in the belt span, and converts that measurement into the actual static tension in the belt. To use the Sonic Tension Meter, begin by entering the belt unit weight, belt width, and the span length. To measure the span vibration, press the "Measure" button on the meter, tap the belt span, and hold the microphone approximately 1/4" away from the back of the belt. The Sonic Tension Meter will display the static tension, and can also display the span vibration frequency.

The belt unit weights for use with the Gates Sonic Tension Meter are shown in the following table.

Belt Product Family	Belt Cross section	Adjusted Belt Weight (grams/meter)
Poly Chain GT2	8mm	4.7
	14mm	7.9

The following are the parameters for belt tensioning on the MSP470.

Drive Shaft Poly Chain Belt:

Pen Tester		*Sonic Tester*
15-16 Lbs	*New*	904 to 986 N
11-13 Lbs	*Used*	657 to 740 N

Engine Shaft Poly Chain Belt:

Pen Tester		*Sonic Tester*
14-15 Lbs	*New*	894 to 975 N
11-12 Lbs	*Used*	650 to 731 N

Testers

A 30 lb pen tester is available thru AEC using part number 053255.

A sonic tester is available thru AEC using part number 053256.

OUR MISSION STATEMENT

Our Mission is to provide superior quality products (manufactured in a safe and efficient environment by highly trained and dedicated personnel), on-time deliveries, with reactive and knowledgeable customer service.

OUR QUALITY POLICY

The Allen Engineering Team is fully committed to exceeding customer expectations for the quality of the products and services provided through the continuous improvement process of reducing waste, defects, and variability in everything we do.

OUR VISION

Our Vision is to be a world-class manufacturer of concrete placing and finishing equipment.

Section 4
PARTS

SECTION 4 PARTS

Factory Service Information

This section contains the illustrated drawings and parts list for help in identifying and/or ordering replacement parts for your machine. Follow the instructions in the front section of this manual “Ordering Parts” when ordering replacement parts to insure prompt and accurate delivery.

The FRONT and/or REAR orientations are defined from the operator’s view of sitting on machine (SOM).

NOTE

All set screws have blue (LOC-TITE™) applied at the factory. If set screw is removed or loosened for any reason re-apply blue (LOC-TITE™).

NOTE

All grease fittings are capped with CAP PLUG GC-5 (AEC PN 015692) to protect the fitting. If cap becomes missing or damaged replace it as soon as possible.

NOTE

Anti-Seize is applied at the factory to drive line couplings, and moving components. If these parts are disassembled re-apply a light coat of a graphite based anti-seize.

Replacement Parts Procedures

SECTION 4
PARTS

We recommend AEC quality replacement parts, available from the AEC Customer Service Department or your nearest AEC Dealer.

Part numbers are subject to change without notice. Part numbers might be different outside of the United States of America. Use part numbers listed in the applicable parts list table when you place your order. If a part number changes, the AEC Customer Service Department or your nearest AEC dealer will have the latest part number for the replacement part.

Remember when you order replacement parts, you will need your model number and serial number. These are the numbers that you have recorded in the UNIT ID section of this manual. Please order replacement parts by the appropriate part number, not the key number.

This manual contains an illustrated parts list for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.

2. Include correct description and part number from the “PARTS” Section 4.

3. Specify exact shipping instructions, including the preferred routing and complete destination address.

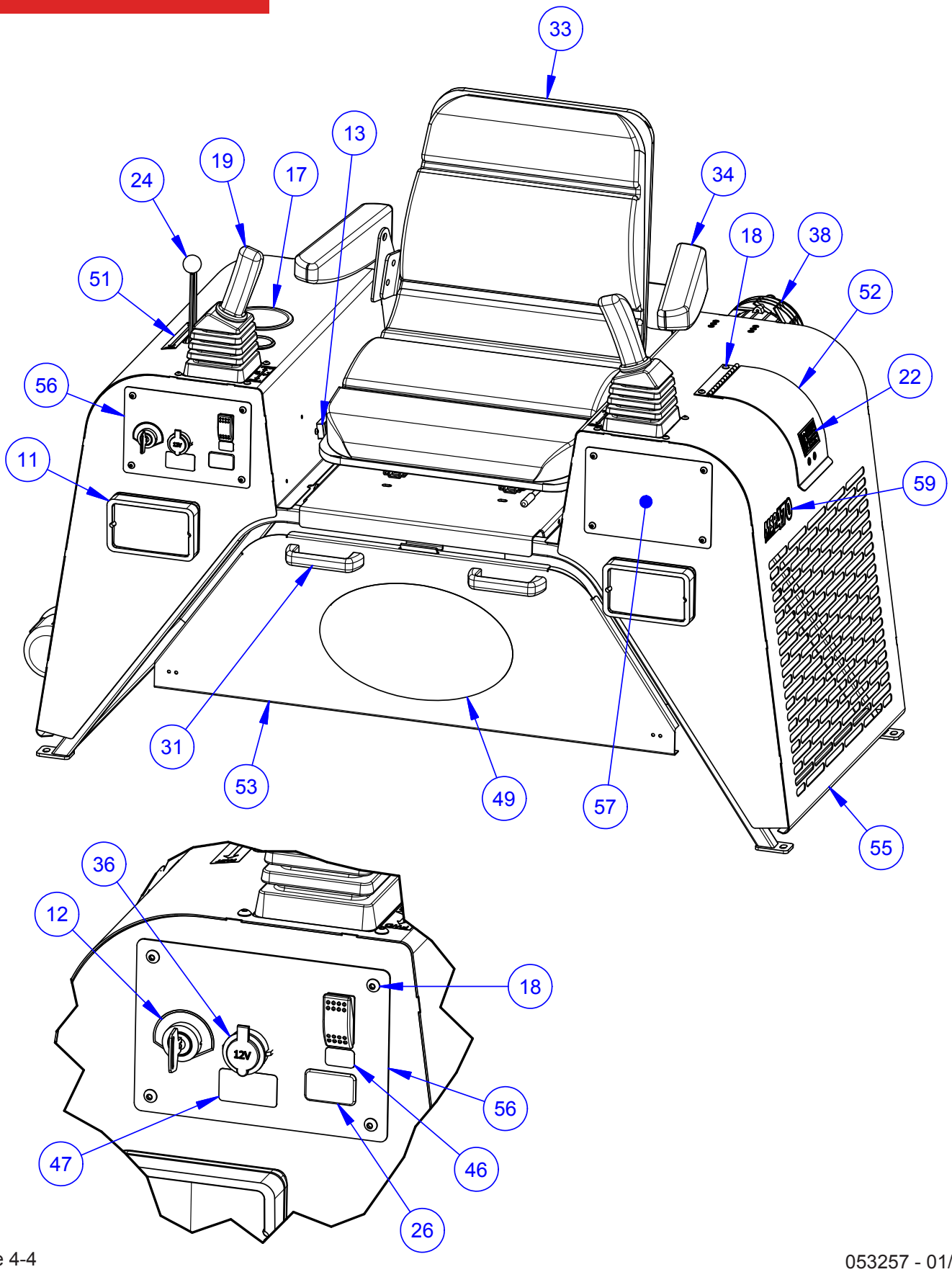
4. DO NOT return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.

5. When placing an order, please contact the AEC Dealer nearest you.

NOTE

All information, specifications, and illustrations in this manual are subject to change without notice and are based on the latest information at the time of publication.

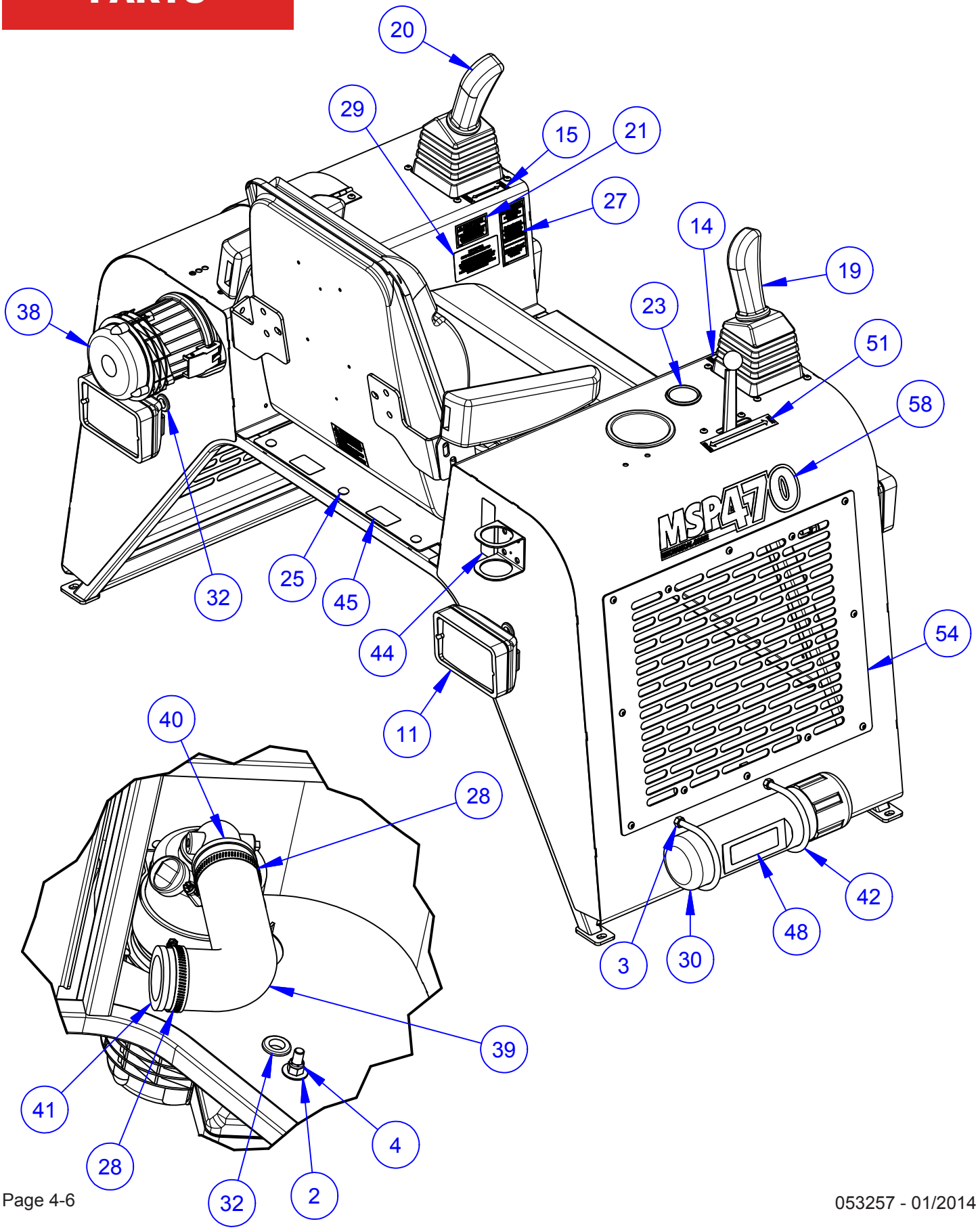
Seat Frame Assembly Illustration



Seat Frame Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010081	FSTN, FW 1/4	2
2	010083	FSTN, FW 3/8	4
3	010102	FSTN, NUT HEX 3/8-16	4
4	010464	FSTN, NUT NYLOK 3/8-16	8
5	010572	FSTN, SCREW 8-32 X 3/8	2
6	013484	SCR, 10-24x1/2 RDH PPH	2
7	015713	BUSHING, NITRILE	4
8	020542	FSTN, NUT STOVER LOCK 1/4-20	4
9	029671	FSTN, NUT HEX 1/4-20 NYLOC	6
10	032125	SWITCH, ROCKER #91B2184	1
11	064749	LED LIGHT 12-24 VOLT (500 LED SL)	4
12	037785	SWITCH, IGNITION	1
13	038965	BLOCK, 200B/150B 8-WAY FUSE	1
14	038979	DECAL, FWD-REV/LT-RT	1
15	038980	DECAL, FWD-REV	1
16	039329	FSTN, CLIP TINNERMAN 1/4-20	16
17	041537	CUP HOLDER	1
18	042343	FSTN, SFBHCS 1/4”-20 x 3/4	33
19	046736	JOYSTICK, RH	1
20	046737	JOYSTICK, LH	1
21	047263	DECAL, DIESEL OVERHEAT CAUTION	1
22	047265	DECAL, HOT COOLANT WARNING	1
23	047406	GUAGE, LOFA MULTIFUNCTION	1
24	047643	LOCKING CONTROL, QUADRASTAT (Q14020)	1
25	047665	RUBBER BUMPER	3
26	047685	HOUR METER	1
27	048181	DECAL, CALIFORNIA PRPSTN 65	1
28	048352	CLAMP, #20 HOSE	2
29	048397	DECAL, COLD WEATHER START	1
30	048665	TUBE, MANUAL PACK PLASTIC 9000-14	1
31	048678	HANDLE, LOAD RATED NYLON (REPLACEMENT ONLY)	1
32	048681	RUBBER GROMMET	4
33	049060	SEAT F/ RIDER	1
34	049062	ARM REST FOR SEAT WITH DRAIN	1
35	049316	NUT, 8-32 NYLOCK HEX	2
36	049588	FEMALE RECEPTICAL 12VDC	1
37	049623	PLATE WMNT, JOYSTICK MNT	2

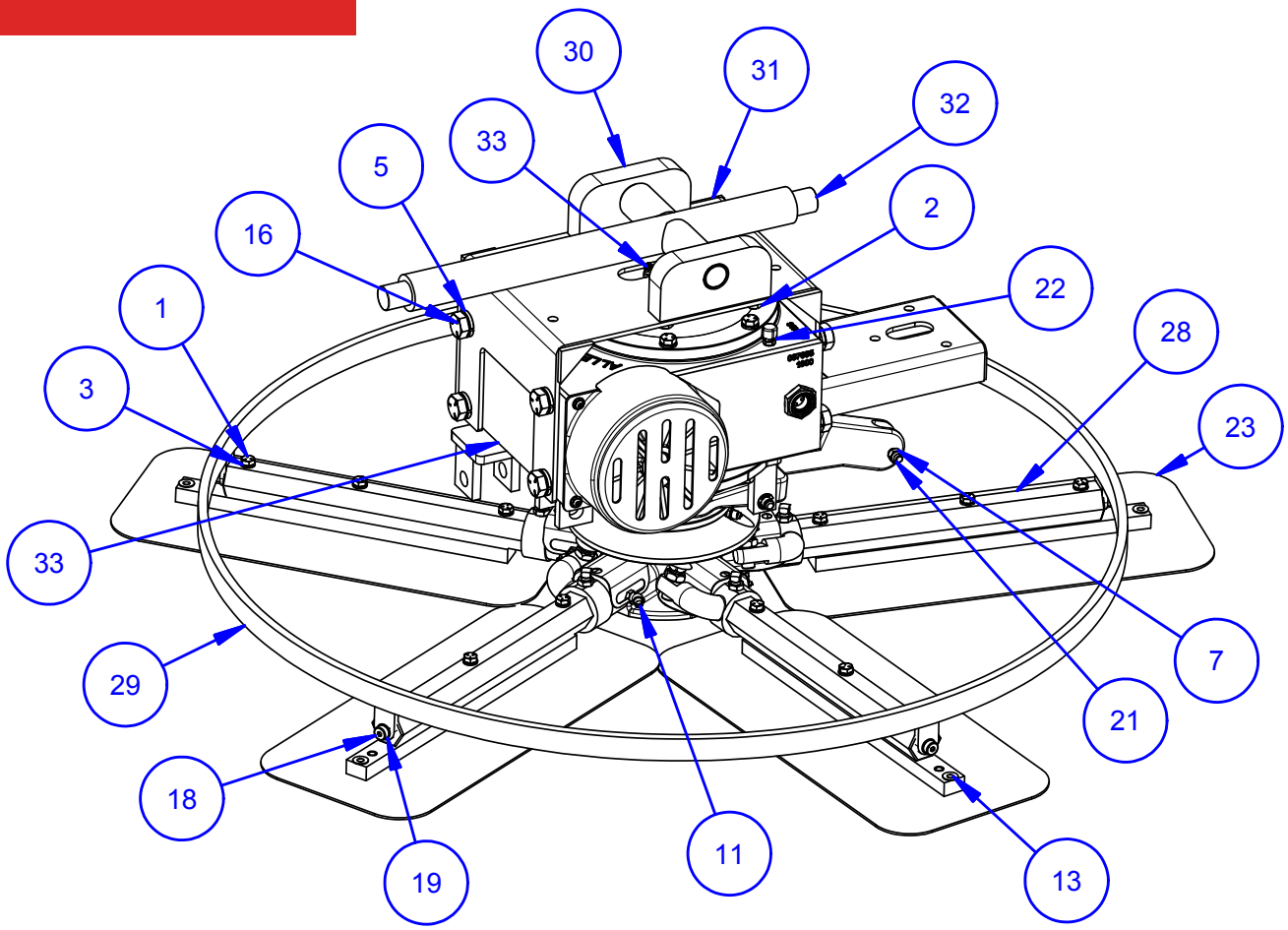
Seat Frame Assembly (cont'd)
Illustration

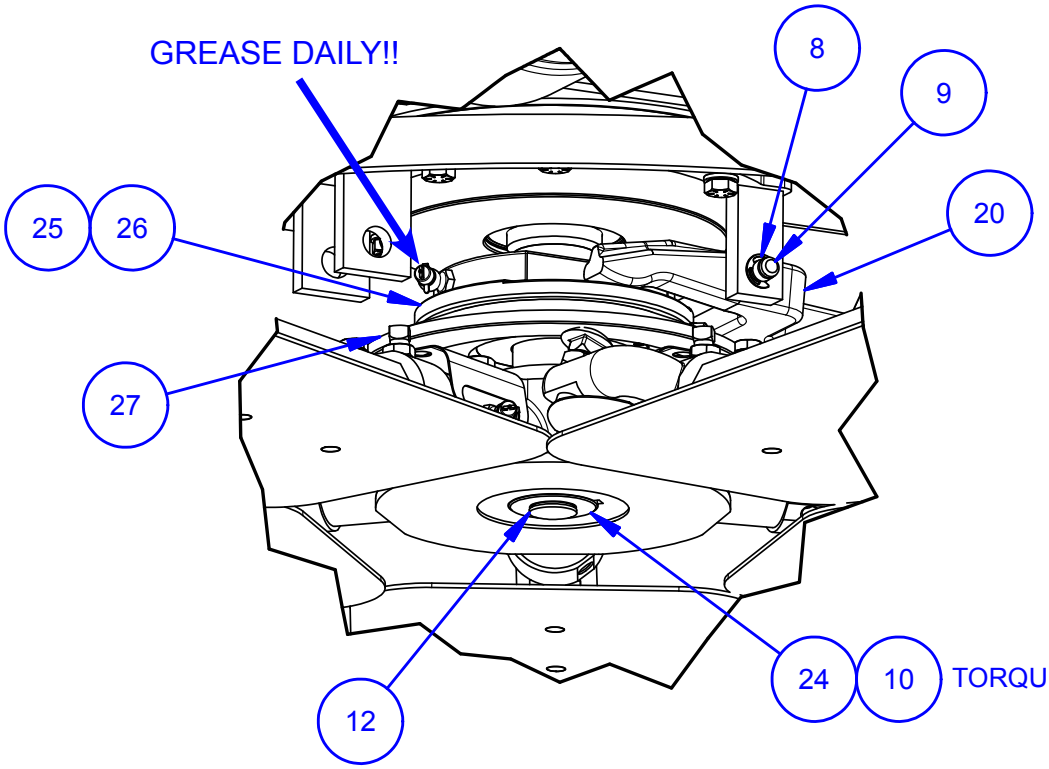


Seat Frame Assembly (cont'd)
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
38	049670	AIR CLEANER, ENGINAIRE	1
39	049844	ELBOW, 2"	1
40	049845	INSERT, 2"X1.5"	1
41	049846	INSERT, 2" X 1.75"	1
42	053189	U-BOLT, 3 1/2" X 3/8-16	2
43	053211	PROP F/ SEAT FRAME	1
44	053447	DECAL, HAND TOOL AREA (SP)	1
45	053449	DECAL, PINCH HAZARD (SP)	2
46	053450	DECAL, LIGHTS (SP)	1
47	053452	DECAL, 12V ACCESSORY (SP)	1
48	053454	DECAL, MANUALS (SP)	1
49	056339	DECAL, 13.35" X 8" ALLEN OVAL	1
50	056920	MAGNETIC LATCH	1
51	057389	DECAL, SLOW/FAST WITH ARROW	1
52	060850	DOOR WMNT	1
53	060857	FRONT SCREEN ASSEMBLY	1
54	060885	FAN COVER	1
55	060904	SEAT FRAME WMNT	1
56	060917	ACCESS PANEL, RH	1
57	060919	ACCESS PANEL, LH	1
58	061302	DECAL, MSP470 - LARGE	1
59	061303	DECAL, MSP470 - SMALL	1
60	032301	CABLE, THROTTLE 72" HD	1

Right Rotor Assembly - 056872
Illustration

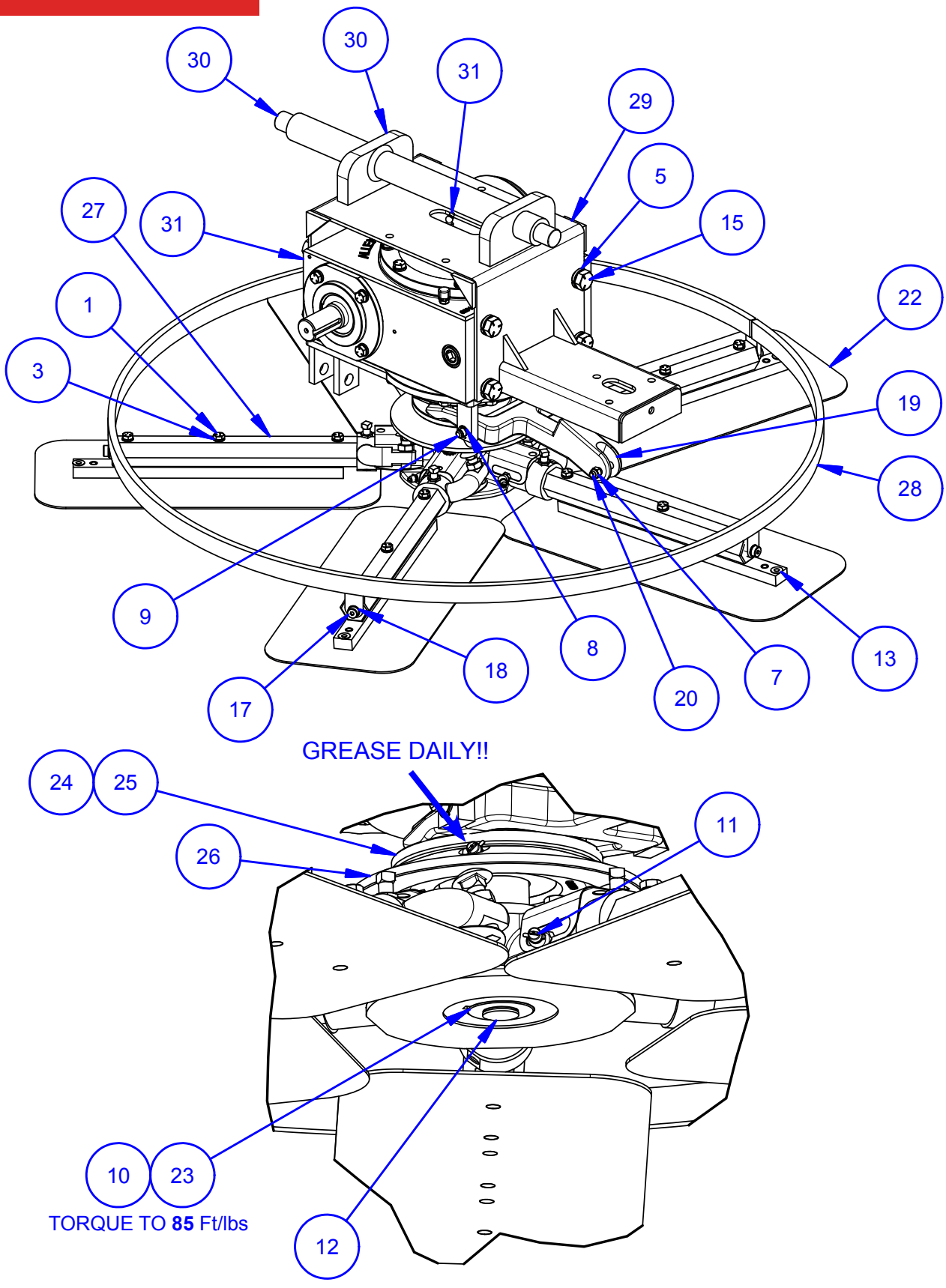




Right Rotor Assembly - 056872
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010024	FSTN, HHCS 5/16-18 X 2 GR 5	15
2	010036	FSTN, HHCS 3/8-16 X 1	4
3	010090	FSTN, LW 5/16	15
4	010091	FSTN, LW 3/8	4
5	010095	FSTN, LW 5/8	8
6	010513	FITTING, 1/4-28 STR GREASE	1
7	012612	FSTN, NUT HEX NYLOCK 5/16-18	1
8	015677	RING, Ø7/16 E-STYLE RETAINING	2
9	015678	PIN, YOKE ARM	1
10	020155	FSTN, SHCS 1/2-13 X 1-1/2 LH	1
11	015692	CAP, Ø1/4 RED GREASE	7
12	015693	PLUG, PLASTIC CAP EC12	1
13	015694	PLUG W-1 RED PLASTIC TAPERD	5
14	015696	KEY, .25x1.25 LG HARD RAD	1
15	019969	FSTN, HHCS 5/8-11 X 1-3/4	4
16	020915	FSTN, HHCS 5/8-11 X 1-1/2 GR 5	4
17	024755	FITTING, 1/8-27 NPT 45° GREASE	1
18	025091	FSTN, 5/16-18x1/2xØ3/8x3/8 SHLDR SCR	5
19	025092	BUSHING, 3/8x1/2x5/16 BRONZE	5
20	026215	ARM, YOKE	1
21	026504	FSTN, SHLD BLT 3/8 X 1-1/4	1
22	029529	VALVE, RELIEF 1/8-27NPT (AIR V)	1
23	037532	BLADE, 8x18 FLAT FINISH GOLD	5
24	037652	WASHER, HD RETAINING	1
25	039685	BEARING, THRUST AXIAL BALL EW	1
26	039686	CAP, SHD PRESSURE PLATE	1
27	039687	PLATE, SHD PRESSURE	1
28	040795	ASSY, 1200-5-SHD RH SOM SPIDER	1
29	040833	RING, 1200VG SD 5 BL STAB	1
30	048561	BEARING ASSEMBLY F/ ROTOR MOUNT X1	2
31	048881	WLDMNT, CROSSHEAD GB MNT	1
32	048964	CROSSHEAD, 2-WAY	1
33	056873	GEARBOX, 20:1 RATIO RH	1

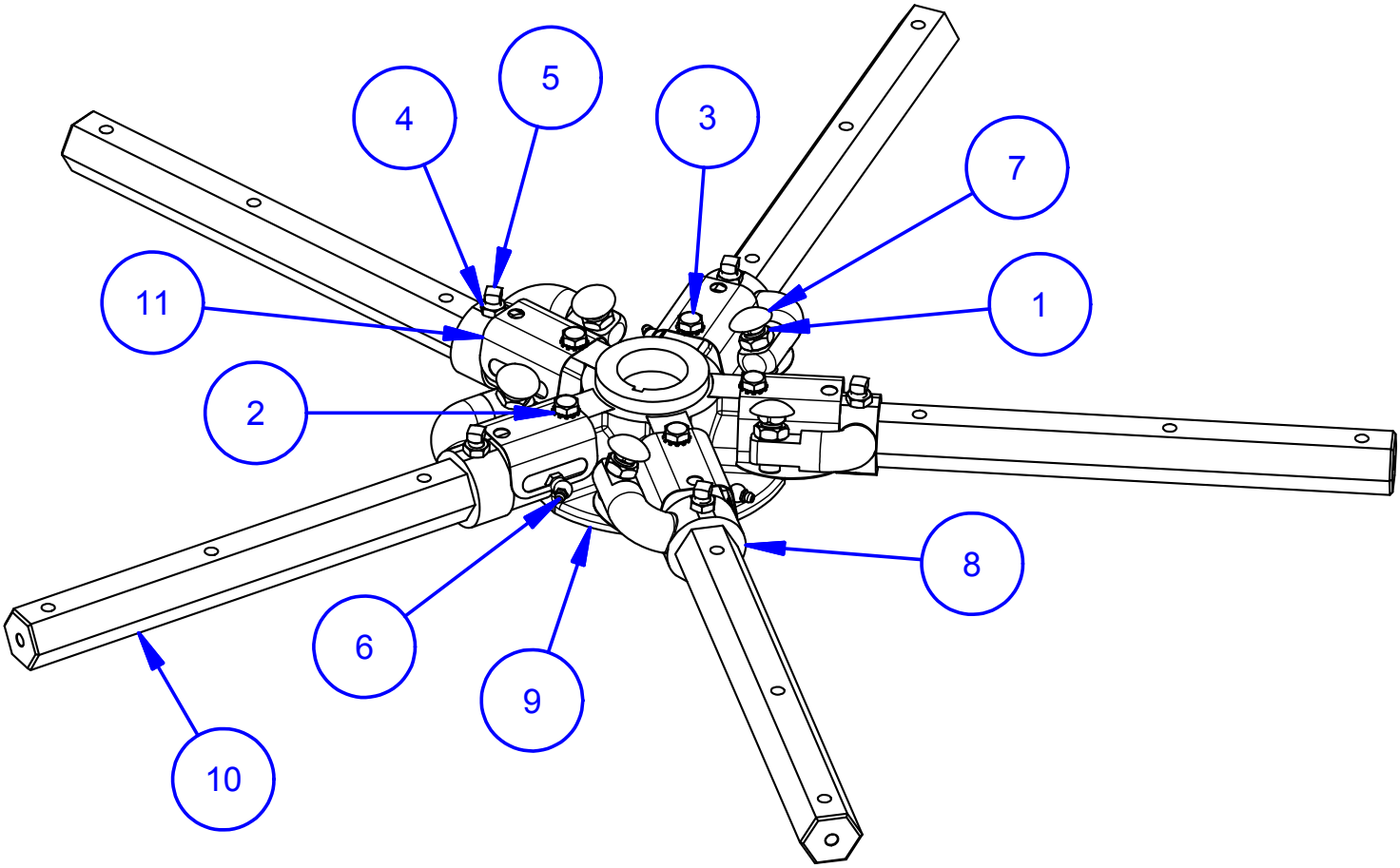
Left Rotor Assembly - 056893
Illustration



Left Rotor Assembly - 056893
Parts List

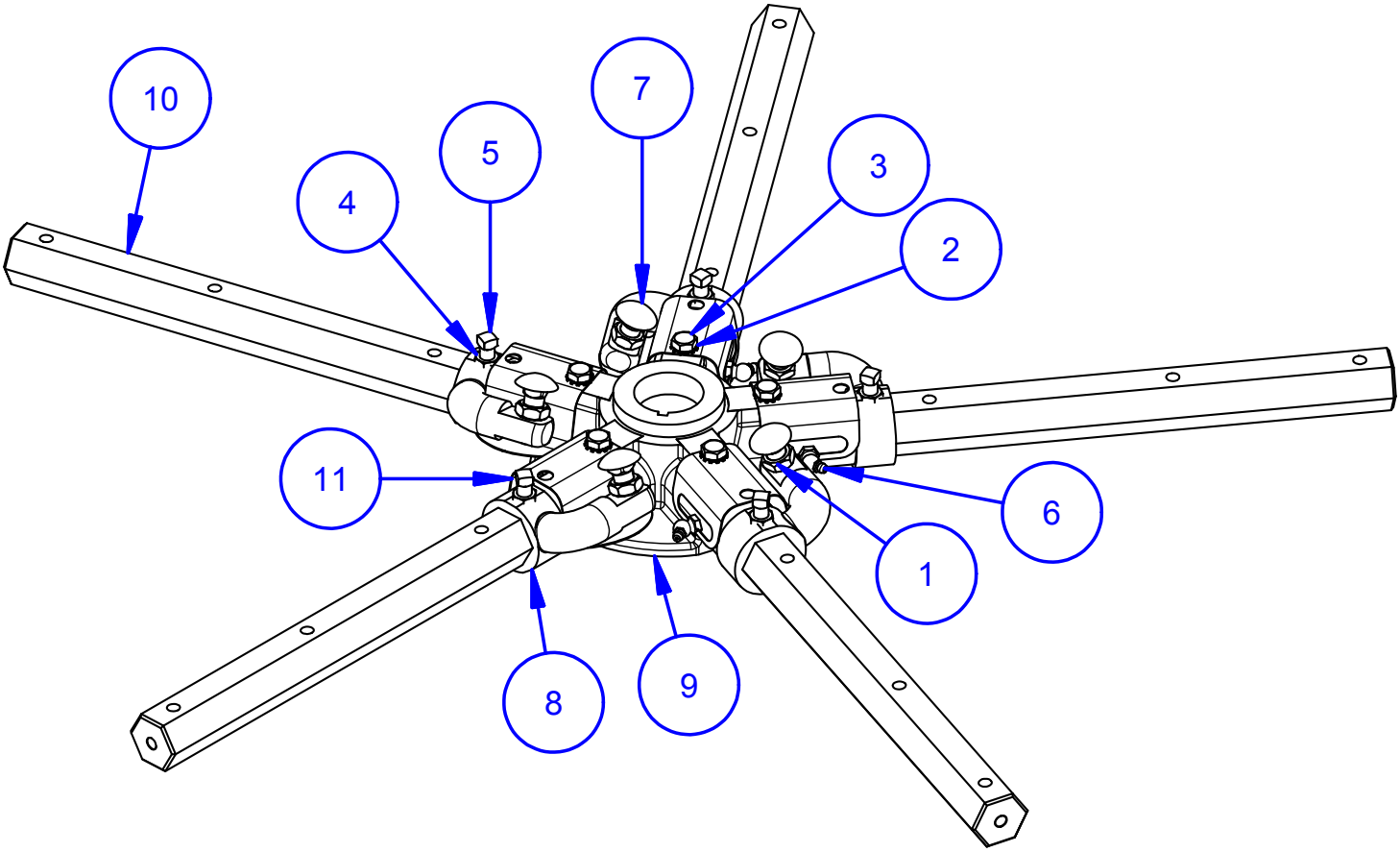
ITEM	PART NO.	DESCRIPTION	QTY
1	010024	FSTN, HHCS 5/16-18 X 2 GR 5	15
2	010036	FSTN, HHCS 3/8-16 X 1	4
3	010090	FSTN, LW 5/16	15
4	010091	FSTN, LW 3/8	4
5	010095	FSTN, LW 5/8	8
6	010513	FITTING, 1/4-28 STR GREASE	1
7	012612	FSTN, NUT HEX NYLOCK 5/16-18	1
8	015677	RING, Ø7/16 E-STYLE RETAINING	2
9	015678	PIN, YOKE ARM	1
10	015691	FSTN, SHCS 1/2-13 X 1-1/2 RH	1
11	015692	CAP, Ø1/4 RED GREASE	7
12	015693	PLUG, PLASTIC CAP EC12	1
13	015694	PLUG W-1 RED PLASTIC TAPERD	5
14	015696	KEY, .25x1.25 LG HARD RAD	1
15	019969	FSTN, HHCS 5/8-11 X 1-3/4	4
16	020915	FSTN, HHCS 5/8-11 X 1-1/2 GR 5	4
17	025091	FSTN, 5/16-18x1/2xØ3/8x3/8 SHLDR SCR	5
18	025092	BUSHING, 3/8x1/2x5/16 BRONZE	5
19	026215	ARM, YOKE	1
20	026504	FSTN, SHLD BLT 3/8 X 1-1/4	1
21	029529	VALVE, RELIEF 1/8-27NPT (AIR V)	1
22	037532	BLADE, 8x18 FLAT FINISH GOLD	5
23	037652	WASHER, HD RETAINING	1
24	039685	BEARING, THRUST AXIAL BALL EW	1
25	039686	CAP, SHD PRESSURE PLATE	1
26	039687	PLATE, SHD PRESSURE	1
27	040794	ASSY, 1200-5-SHD LH SOM SPIDER	1
28	040833	RING, 1200VG SD 5 BL STAB	1
29	048881	WLDMNT, CROSSHEAD GB MNT	1
30	048966	CROSSHEAD, 2-WAY	1
31	056894	GEARBOX, 20:1 RATIO LH	1
32	201163	FITTING, 1/8-27 PTF STR GREASE	1

Right Spider Assembly - 040795
Illustration and Parts List



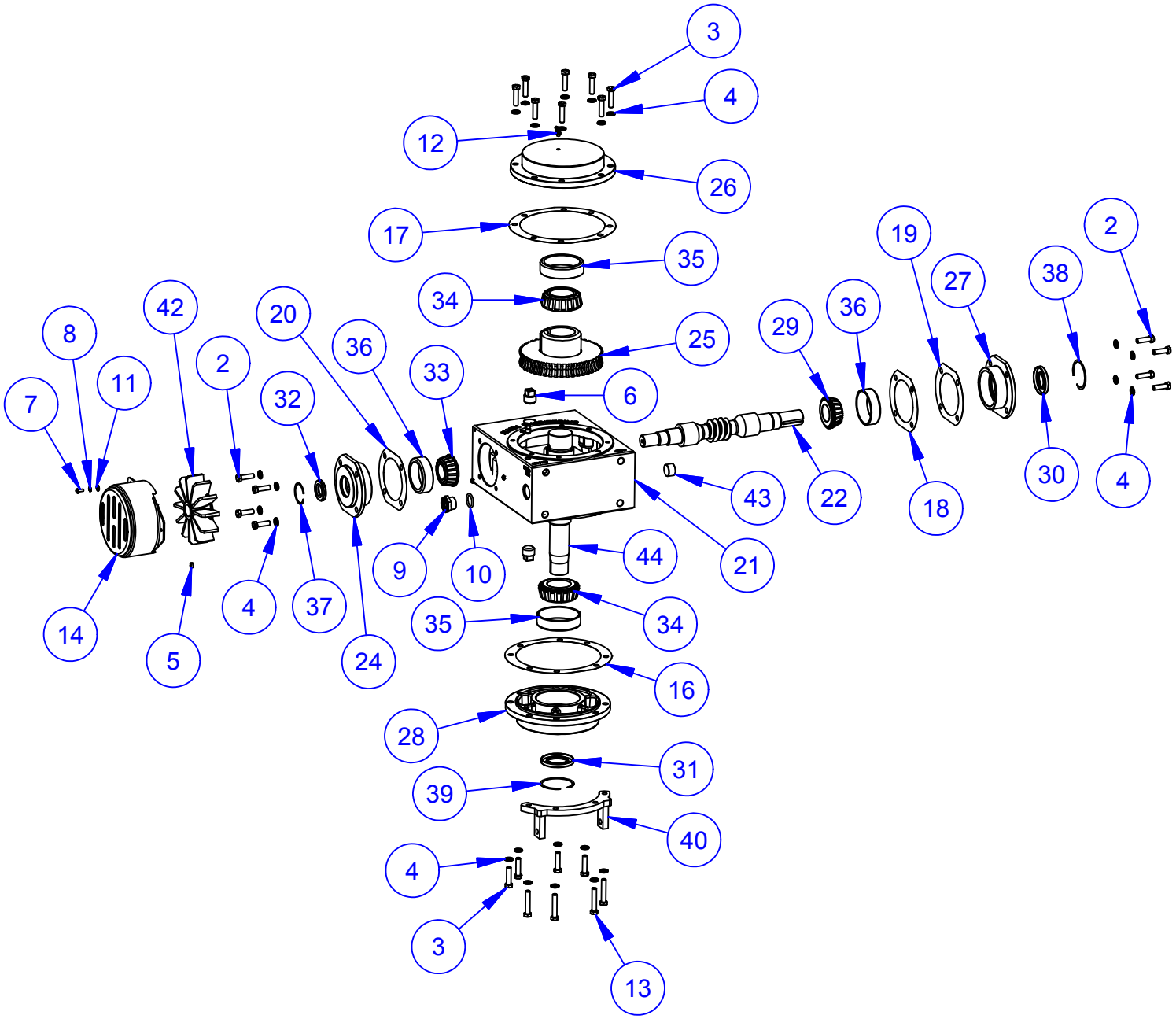
ITEM	PART NO.	DESCRIPTION	QTY
1	010050	NUT, 1/2-13 JAM HEX	5
2	015682	WASHER, 3/8 EXT TOOTH LOCK	5
3	015683	BOLT, 3/8-16 X 7/8 DOG PT HEX HD CAP	5
4	015684	NUT, 3/8-16 JAM HEX	5
5	015686	FSTN, SQHSS 3/8-16 X 1	5
6	024755	FITTING, 1/8-27 NPT 45° GREASE	5
7	028216	BOLT, 1/2-13 X 1 1/2 GR 8 CARRIAGE	5
8	033034	LEVER, LIFT SD UNIVERSAL	5
9	064220	SPIDER BOSS, SHD 5 BLADE UNIVERSAL	1
10	040700	ARM, 5 BOSS SPIDER ASSY TROWEL	5
11	040792	CLIP, 46-48 UNIV SPIDER SPRING	5

Left Spider Assembly - 040794
Illustration and Parts List



ITEM	PART NO.	DESCRIPTION	QTY
1	010050	NUT, 1/2-13 JAM HEX	5
2	015682	WASHER, 3/8 EXT TOOTH LOCK	5
3	015683	BOLT, 3/8-16 X 7/8 DOG PT HEX HD CAP	5
4	015684	NUT, 3/8-16 JAM HEX	5
5	015686	FSTN, SQHSS 3/8-16 X 1	5
6	024755	FITTING, 1/8-27 NPT 45° GREASE	5
7	028216	BOLT, 1/2-13 X 1 1/2 GR 8 CARRIAGE	5
8	033034	LEVER, LIFT SD UNIVERSAL	5
9	064220	SPIDER BOSS, SHD 5 BLADE UNIVERSAL	1
10	040700	ARM, 5 BOSS SPIDER ASSY TROWEL	5
11	040792	CLIP, 46-48 UNIV SPIDER SPRING	5

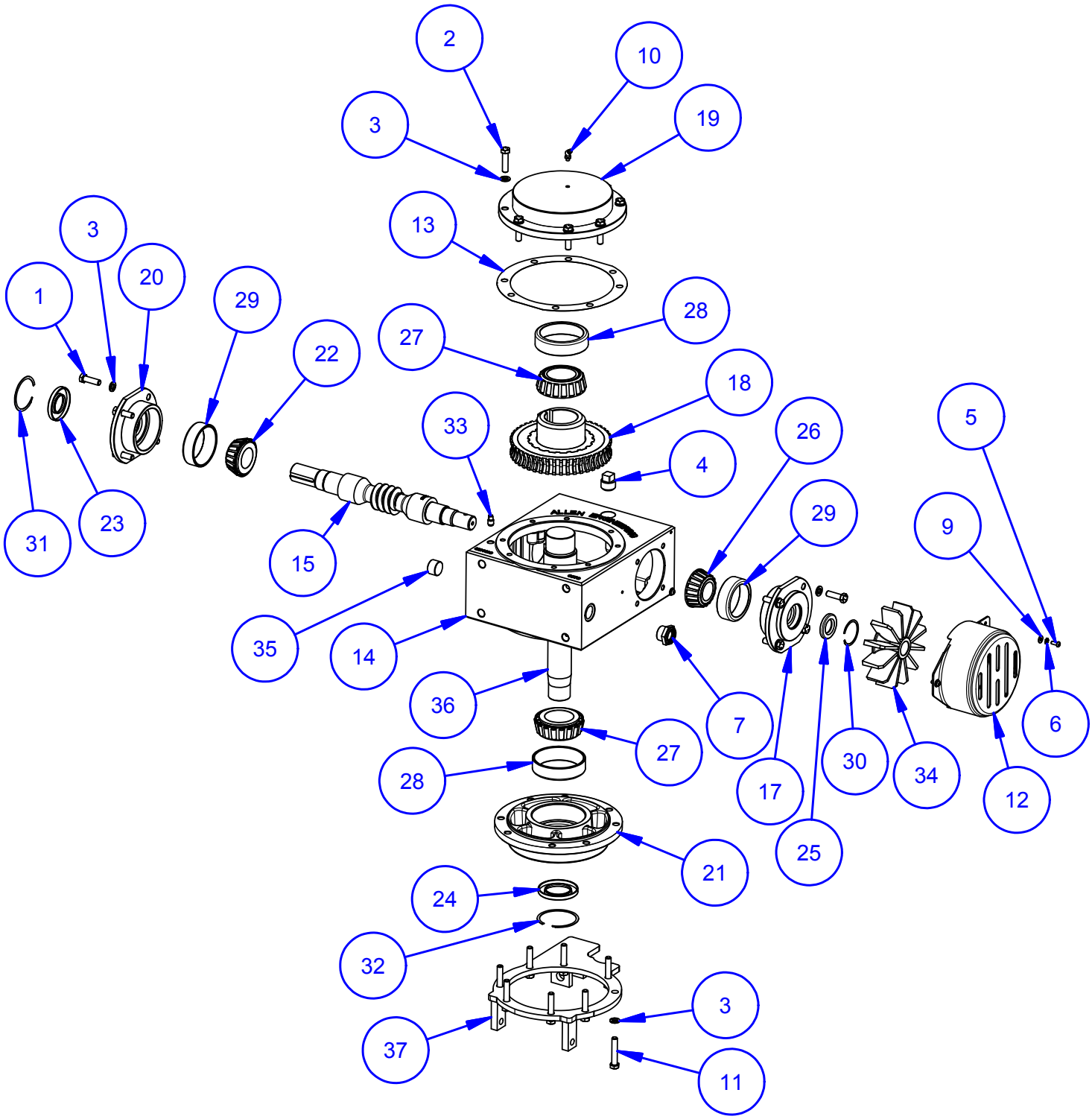
Right Gearbox Assembly - 037655
Illustration



Right Gearbox Assembly - 037655
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	001004	OIL, MOBILE SHC 634 GEAR	.75 GAL
2	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	8
3	010038	BOLT, 3/8-16x1-1/2 GR 5 HHCS	12
4	010091	WSHR, Ø3/8 ID Z-STL SPLIT LOCK	24
5	012869	SCR, 1/4-20x3/8 BO SKT SET	1
6	012953	PLUG, 3/4 NPTF BI SQ HD PIPE	2
7	013484	SCR, 10-24x1/2 RDH PPH	3
8	013740	FSTN, LW STAR #10	3
9	015672	GAUGE, 3/4-14 NPT PORTHOLE VIEW	1
10	015673	O-RING, 15/16x1-3/16x1/8 BUNA	1
11	018072	WSHR, #10 Z STL SAE FLAT	3
12	018510	FITTING, 1/4-28 NPT 45° GREASE	1
13	026775	SCR, 3/8-16x2 GR 8 HHC	4
14	028703	SHROUD, FAN GEARBOX SHD	1
15	028914-10	SHIM, .010 LGE GEARBOX CVR	1
16	028914-2	SHIM, .002 LGE GEARBOX CVR	1
17	028914-XX	SHIM, (GENERIC) LGE GEARBOX CVR	1
18	028915-10	SHIM, .010 LGE GEARBOX FLANGE	1
19	028915-5	SHIM, .005 LGE GEARBOX FLANGE	1
20	028915-XX	SHIM, (GENERIC) LGE GEARBOX FLG	1
21	029143	CASE, SHD GEARBOX	1
22	029144	SHAFT, COUNTER LH SHD	1
23	029146	KEY, GEARBOX SQ 1/2x2.500	1
24	029147	FLANGE, GEARBOX SHD	1
25	029148	GEAR, 20:1 LH BRONZE	1
26	029150	CAP, SHD GEARBOX LARGE	1
27	029154	CAP, SHD GEARBOX END	1
28	029155	CAP, BOTTOM GEARBOX SHD	1
29	029178	BEARING, Ø1.4375 BORE TAPERED	1
30	029179	SEAL, Ø1.375 RADIAL SHAFT OIL	1
31	029180	SEAL, Ø1.875 RADIAL SHAFT OIL	1
32	029181	SEAL, Ø1.125 RADIAL SHAFT OIL	1
33	029182	BEARING, Ø1.3125 BORE TAPERED	1
34	029183	BEARING, Ø2 BORE TAPERED	2
35	029184	CUP, Ø3-43/64 TPR ROLLER BRG	2
36	029272	CUP, Ø3 TPR ROLLER BRG	2
37	032713	RING, Ø1.827 RETAINING	1
38	032714	RING, Ø2.478 RETAINING	1
39	032715	RING, Ø2.857 RETAINING	1
40	032716	BRACKET, SD GEARBOX	1
41	032745	PLUG, 1/8 NPT RED POLTHN THD	1
42	034541	FAN, SHD GEARBOX	1
43	035327	PLUG, 3/4-14 NPTF HOLLOW HEX	1
44	037651	SHAFT, MAIN LH SHD GEARBOX	1

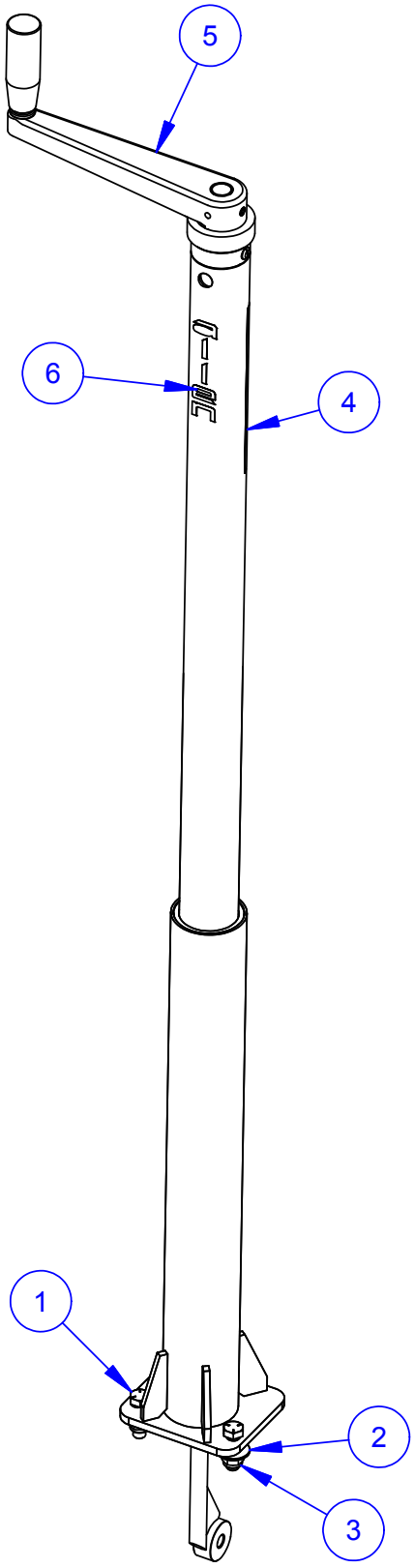
Left Gearbox Assembly - 056894
Illustration

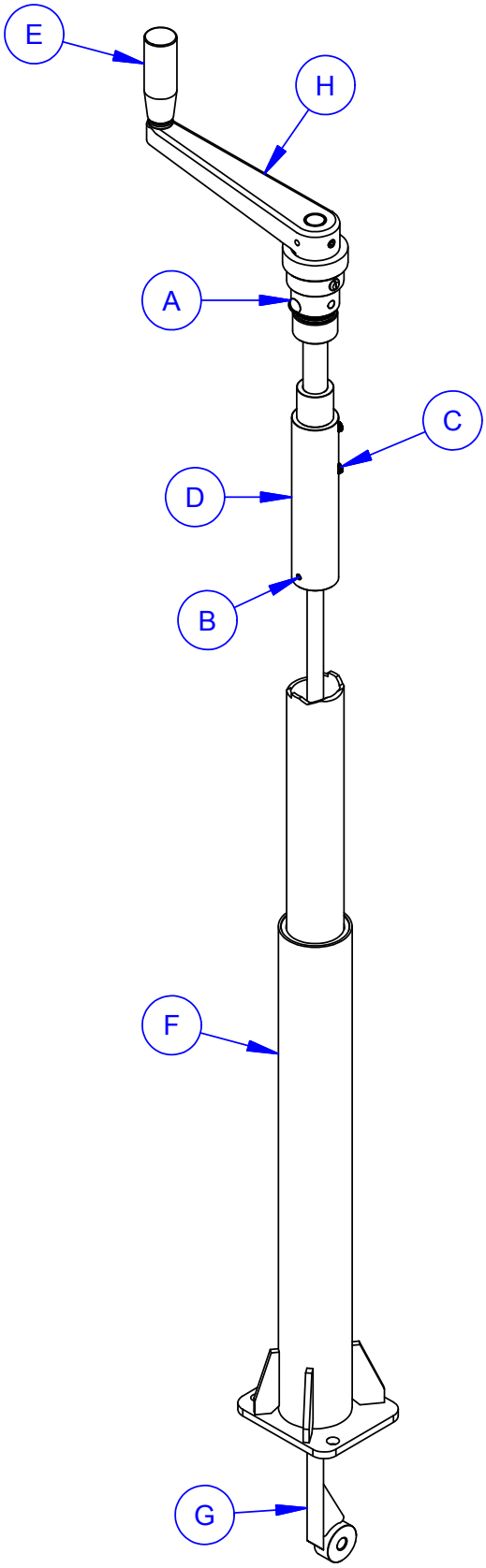


Left Gearbox Assembly - 056894
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	8
2	010038	FSTN, HHCS 3/8-16 X 1-1/2 GR 5	8
3	010091	FSTN, LW 3/8	24
4	012953	PLUG, 3/4 NPTF BI SQ HD PIPE	2
5	013484	FSTN, SCREW RHPMS 10-24 X 1/2	3
6	013740	FSTN, LW STAR #10	3
7	015672	GAUGE, 3/4-14 NPT PORTHOLE VIEW	1
8	015673	O-RING, 15/16x1-3/16x1/8 BUNA	1
9	018072	FSTN, FW #10 SAE	3
10	018510	FITTING, 1/4-28 NPT 45° GREASE	1
11	026775	FSTN, HHCS 3/8-16NC X 2 GR 8	8
12	028703	SHROUD, FAN GEARBOX SHD	1
13	028914-XX	SHIM, (GENERIC) LGE GEARBOX CVR	1
14	029143	CASE, SHD GEARBOX	1
15	029145	SHAFT, COUNTER RH SHD	1
16	029146	KEY, GEARBOX SQ 1/2x2.500	1
17	029147	FLANGE, GEARBOX SHD	1
18	029149	GEAR, 20:1 RH BRONZE	1
19	029150	CAP, SHD GEARBOX LARGE	1
20	029154	CAP, SHD GEARBOX END	1
21	029155	CAP, BOTTOM GEARBOX SHD	1
22	029178	BEARING, Ø1.4375 BORE TAPERED	1
23	029179	SEAL, Ø1.375 RADIAL SHAFT OIL	1
24	029180	SEAL, Ø1.875 RADIAL SHAFT OIL	1
25	029181	SEAL, Ø1.125 RADIAL SHAFT OIL	1
26	029182	BEARING, Ø1.3125 BORE TAPERED	1
27	029183	BEARING, Ø2 BORE TAPERED	2
28	029184	CUP, Ø3-43/64 TPR ROLLER BRG	2
29	029272	CUP, Ø3 TPR ROLLER BRG	2
30	032713	RING, Ø1.827 RETAINING	1
31	032714	RING, RETAINING Ø2.4780	1
32	032715	RING, Ø2.857 RETAINING	1
33	032745	PLUG, 1/8 NPT RED POLTHN THD	1
34	034541	FAN, SHD GEARBOX	1
35	035327	PLUG, 3/4-14 NPTF HOLLOW HEX	1
36	037650	SHAFT, MAIN RH SHD GEARBOX	1
37	056895	CYL MNT WMNT LH	1

Pitch Control Assembly Illustrations

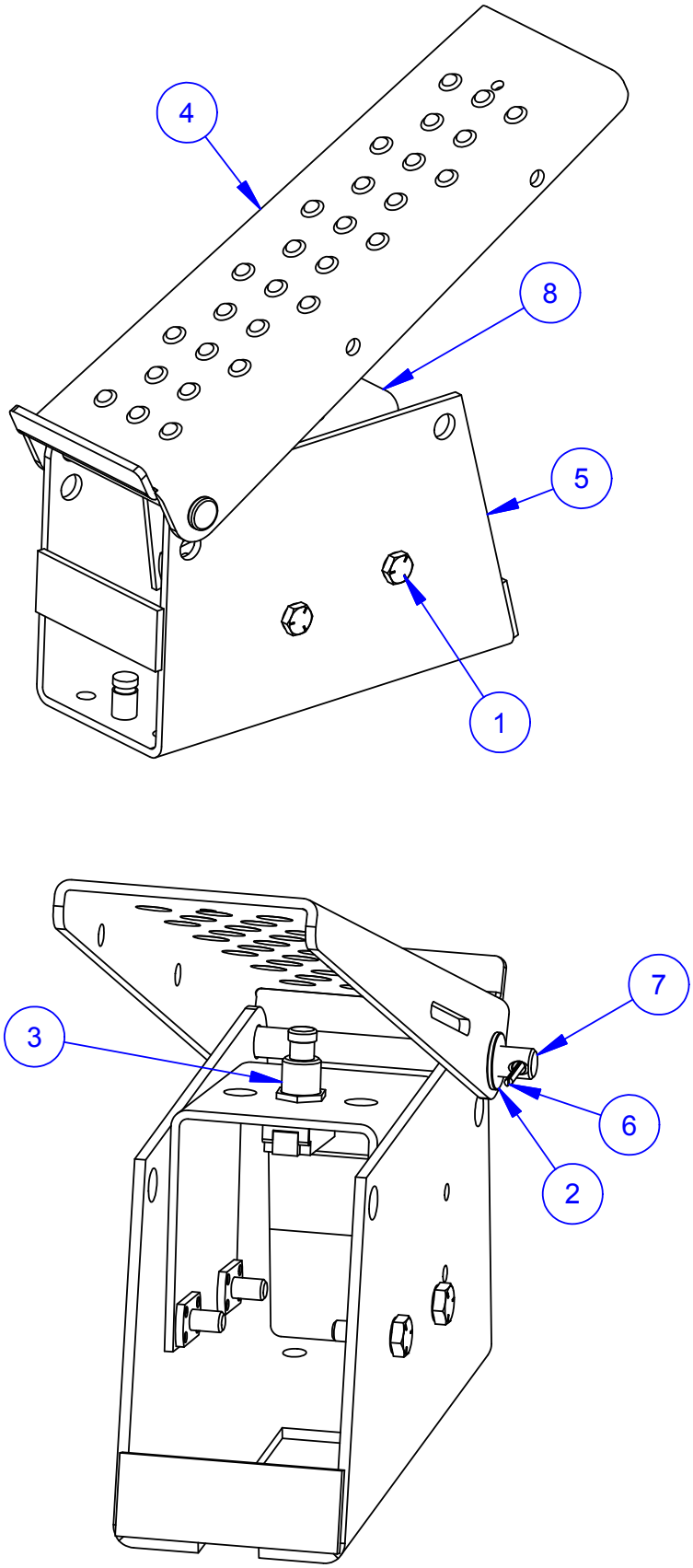




ITEM	PART NO.	DESCRIPTION	QTY
1	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	3
2	010083	FSTN, FW 3/8	3
3	010464	FSTN, NUT NYLOK 3/8-16	3
4	032377	DECAL, F/ PITCH CONTROL TUBE	1
5	038174	RIDER MANUAL PITCH CONTROL ASSY	1
6	053442	DECAL, ALLEN VERTICAL BRUSHED CHROME	1

ITEM	PART NO.	DESCRIPTION	QTY
A	015410	FSTN, RHMS 1/4-20 X 3/8	2
B	015747	PIN, ROLL 3/16 X 1-3/8 SPIROL	1
C	015768	FSTN, SHCS 1/4-20 X 1/4 HOLO	2
D	029812	BUSHING, SLIDE PITCH CONTROL PITCH CONTROL TUBE	1
E	032115	KNOB,PITCH CONTROL HANDLE (RT)	1
F	038176	WELD'T, SP400B PITCH CONT TUBE	2
G	038178	WELD'T, SP400-PST PC SHAFT	1
H	040147	ASSY, SP/HP PITCH CONT CRANK HANDLE	1

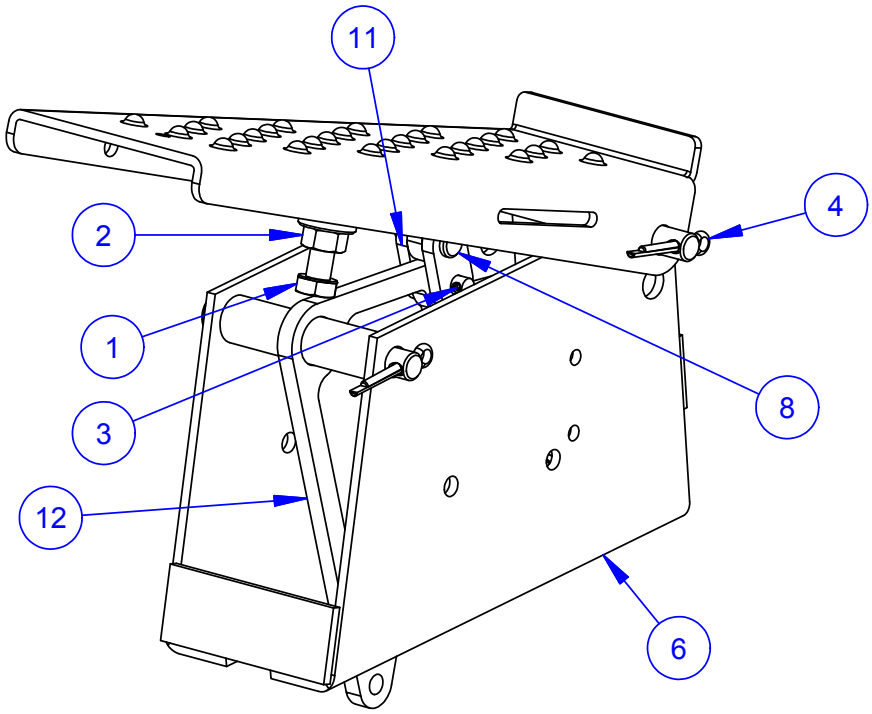
Kill Switch Pedal Assembly - 059535
Illustration

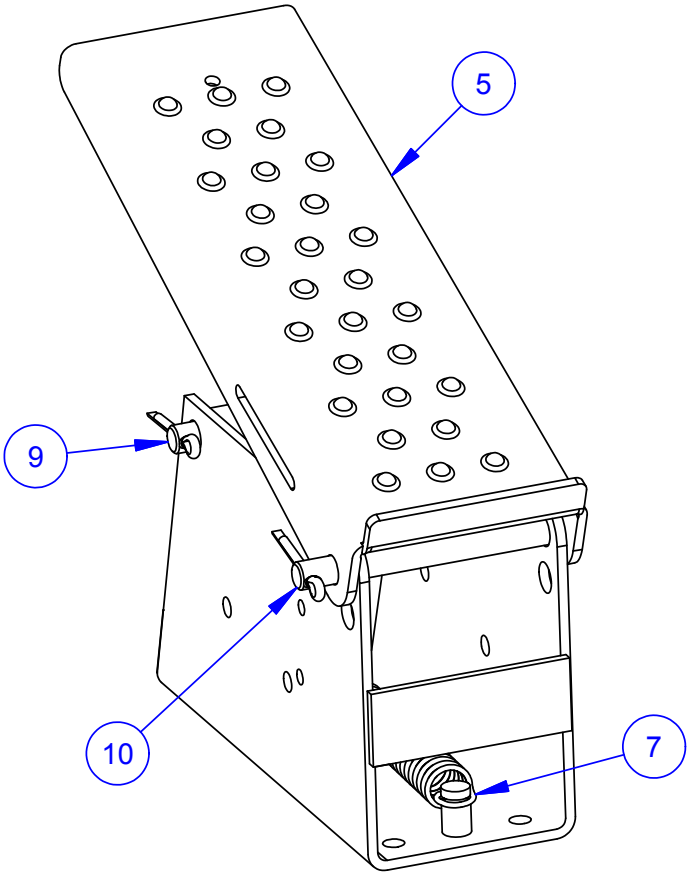


Kill Switch Pedal Assembly - 059535
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010002	FSTN, HHCS 1/4-20 X 3/4	4
2	010082	FSTN, FW 5/16	1
3	033892	SWITCH, KILL FOR RIDING TROWEL	1
4	024840	PLATE, PEDAL FOOT SPEED	1
5	024851	THROTTLE HOUSING WMNT	1
6	026226	PIN, Ø3/32 X 3/4 ZP STL COTTER	1
7	028895	FSTN, PIN CLEVIS 3/8 X 3 3/4	1
8	041596	WELDMENT, KILL SWITCH PLATE	1
-	037800	ASSY, KILL SWITCH N.O. LONG	-

Throttle Pedal Assembly - 059533
Illustration

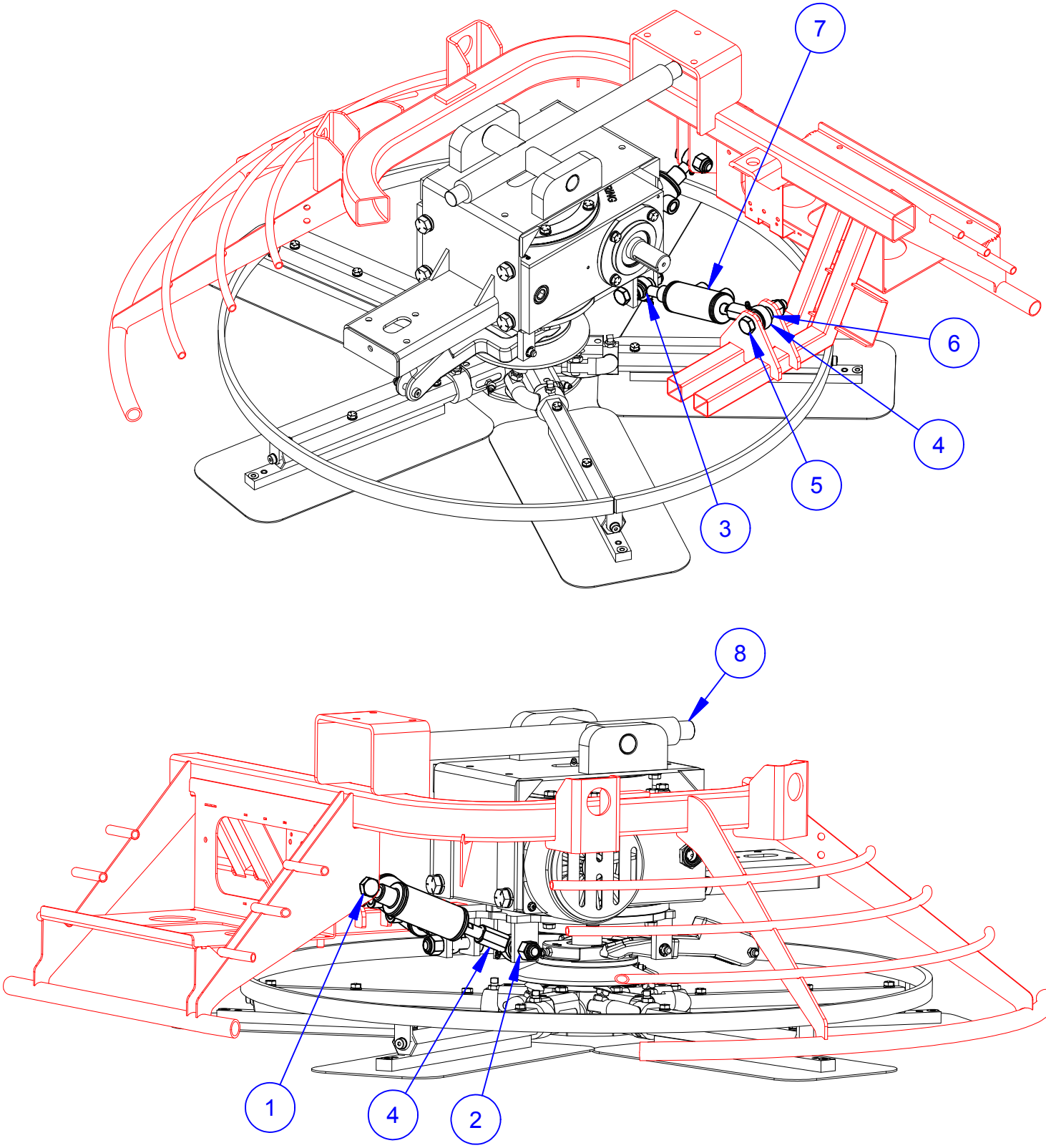




Throttle Pedal Assembly - 059533
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010020	SCR, 5/16-18x1 HHC	1
2	010100	FSTN, NUT HEX 5/16-18	1
3	010131	PIN, Ø1/16 X 1 ZP STL COTTER	2
4	012361	PIN, Ø1/8 X 1 COTTER	2
5	024839	ASSY, FOOT SPEED PEDAL	1
6	024851	THROTTLE HOUSING WMNT	1
7	024981	EXTENSION SPRING	1
8	024982	FSTN, PIN CLEVIS 1/4 X 51/64	2
9	024983	FSTN, PIN CLEVIS 3/8 X 3-1/4	1
10	028895	FSTN, PIN CLEVIS 3/8 X 3 3/4	1
11	040246	SHACKLE 1-1/4” FOOT SPEED SHORT	2
12	059534	FULCRUM WMNT	1
13	037796	CABLE, THROTTLE 38”	1

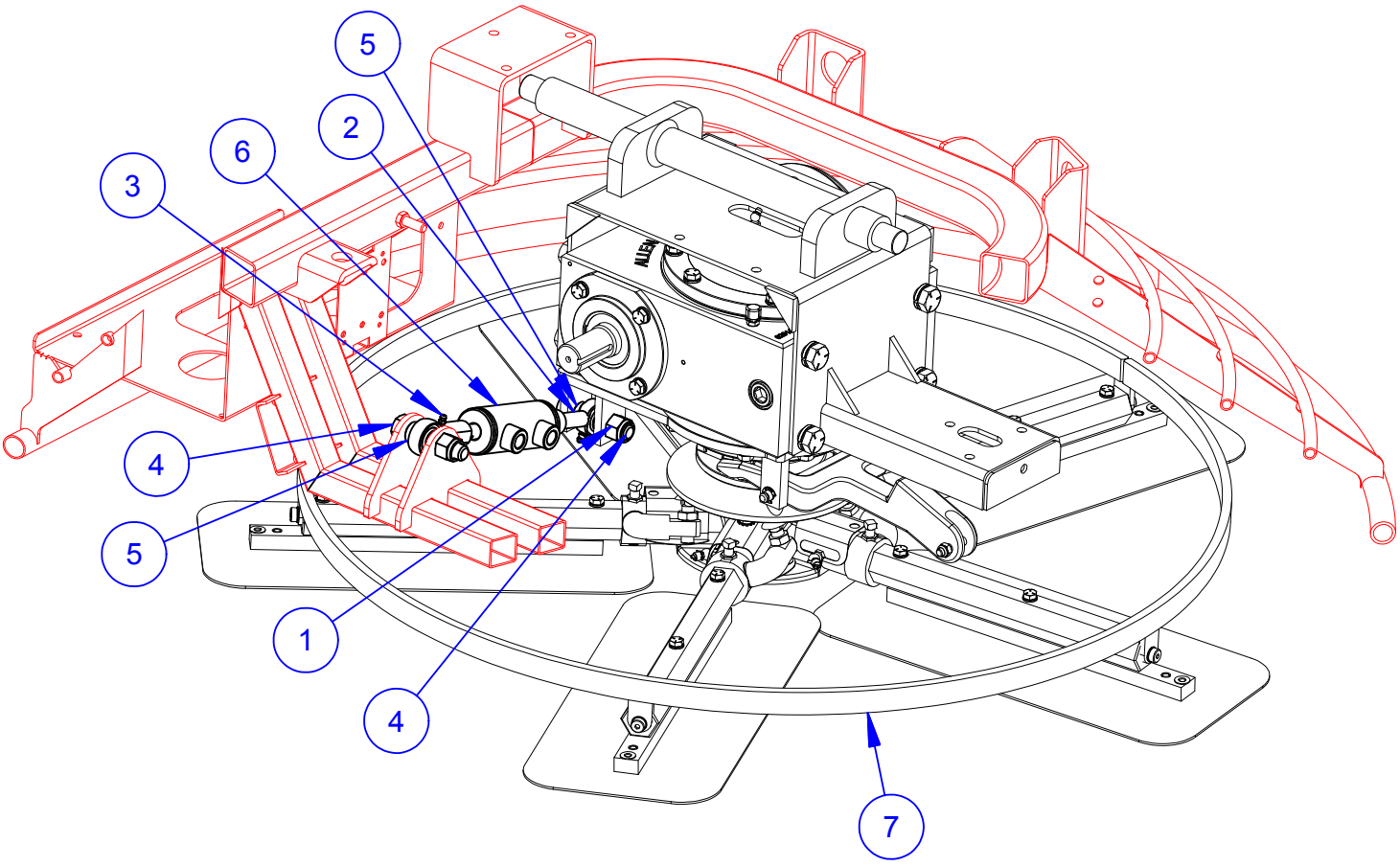
Right Hand Steering Assembly Illustration



Right Hand Steering Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010632	FSTN, HHCS 5/8-11 X 2 GR 8	1
2	037139	FSTN, NUT NYLOC 5/8-18 GR 8	4
3	043124	ROD, END MALE 5/8	2
4	043125	ROD END, 5/8 FEMALE	2
5	048455	FSTN, HHCS 5/8-11 x 3 GR 8	3
6	048627	SPACER, STEERING CONNECTION	6
7	048660	CYLINDER, 1.5x.625 STEERING	2
8	056872	MODULE, 20:1 RH ROTOR ASSY	1

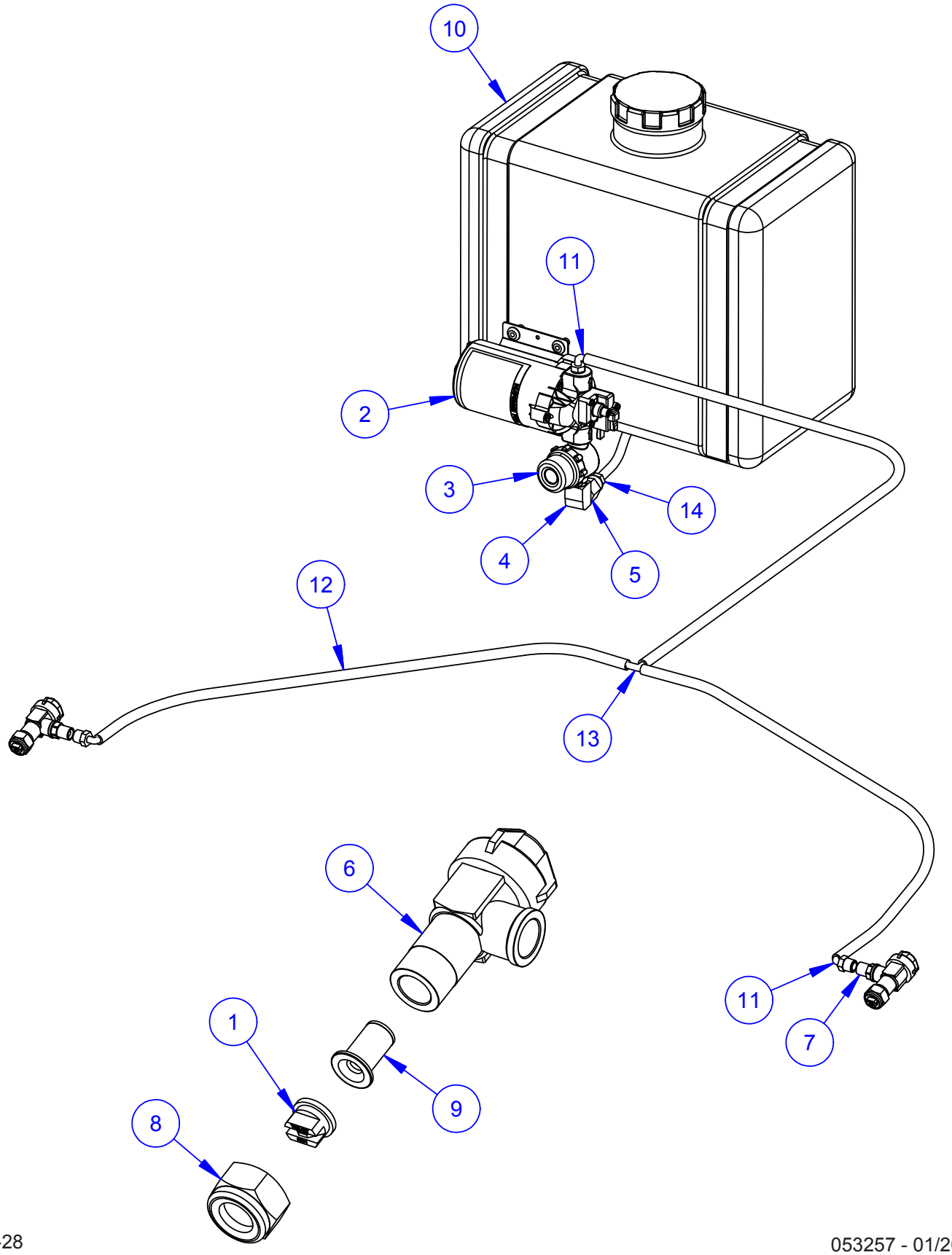
Left Hand Steering Assembly Illustration



Left Hand Steering Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	037139	FSTN, NUT NYLOC 5/8-18 GR 8	4
2	043124	ROD, END MALE 5/8	2
3	043125	ROD END, 5/8 FEMALE	2
4	048455	FSTN, HHCS 5/8-11 x 3 GR 8	4
5	048627	SPACER, STEERING CONNECTION	4
6	048660	CYLINDER, 1.5x.625 STEERING	2
7	056893	MODULE, 20:1 LH ROTOR ASSY	1

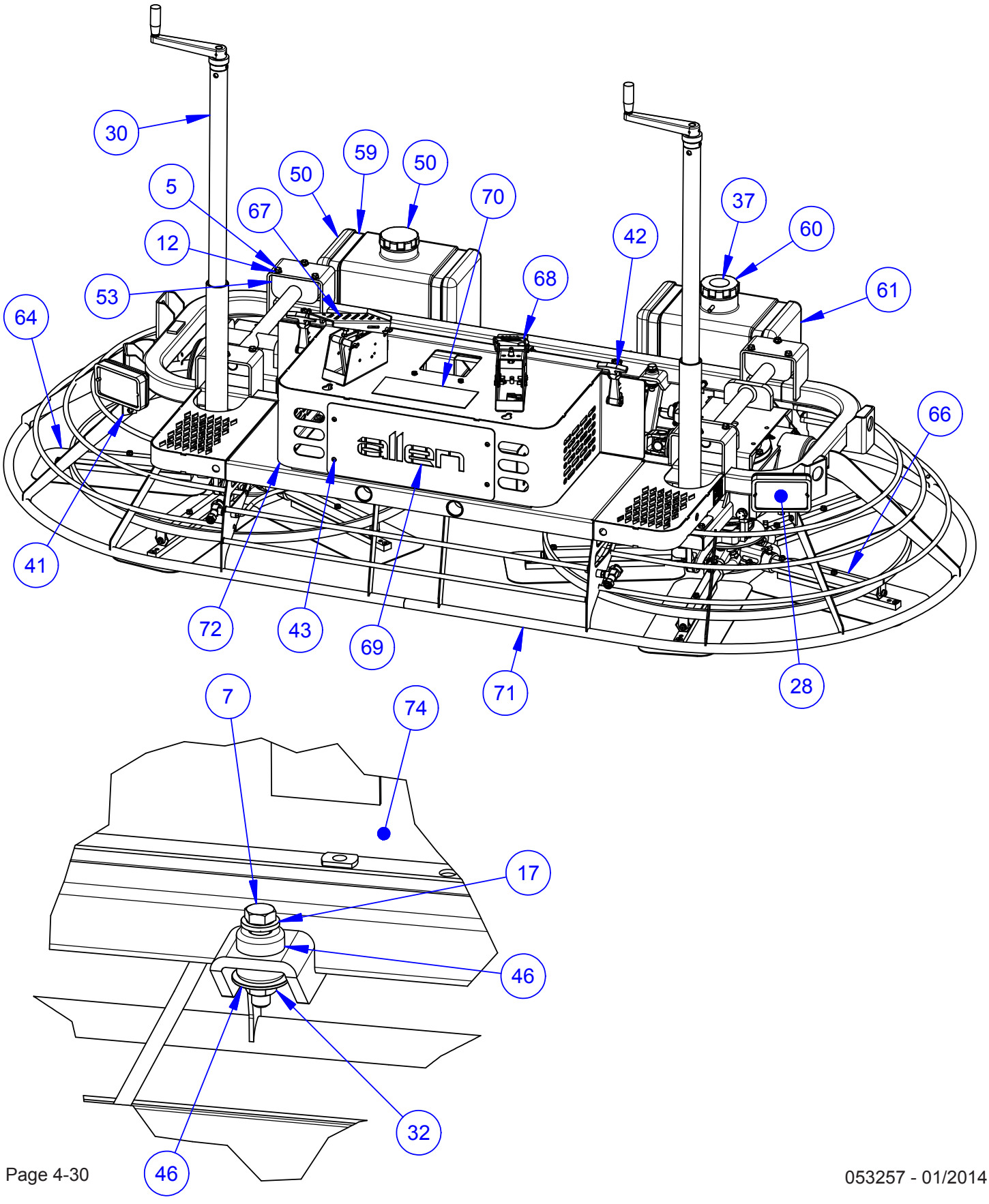
Spray System Assembly Illustration



Spray System Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	012702	TIP, 80°x0.10 GPM BRASS SPRAY	2
2	033735	PUMP, SPRAY SYSTEM	1
3	040209	FILTER, RETARDANT SPRAY SYSTEM	1
4	040387	ELBOW, 3/8 BRASS 90° STREET	1
5	040388	FTG, 3/8X1/4 BRASS FM TO FM REDUCER	1
6	041604	BODY, NYLON CHECK VALVE NOZ	2
7	041606	NIPPLE, 1/4 NPT CLOSE PLASTIC	2
8	041624	RETAINER, NYLON SPRAY TIP	2
9	047579	STRAINER, POLY 100 µ MESH	2
10	047700	TANK, 6 GALLON WATER PLASTIC	1
11	047933	ELBOW, 1/4 PUSHLOK x 1/4 NPT PLASTIC	3
12	048246	HOSE, 3/8” WATER LINE	1
13	048652	TEE, PLASTIC 1/4 x 1/4 x 1/4	1
14	048653	BARB, HOSE PLASTIC 1/4” x 1/4 NPT	1

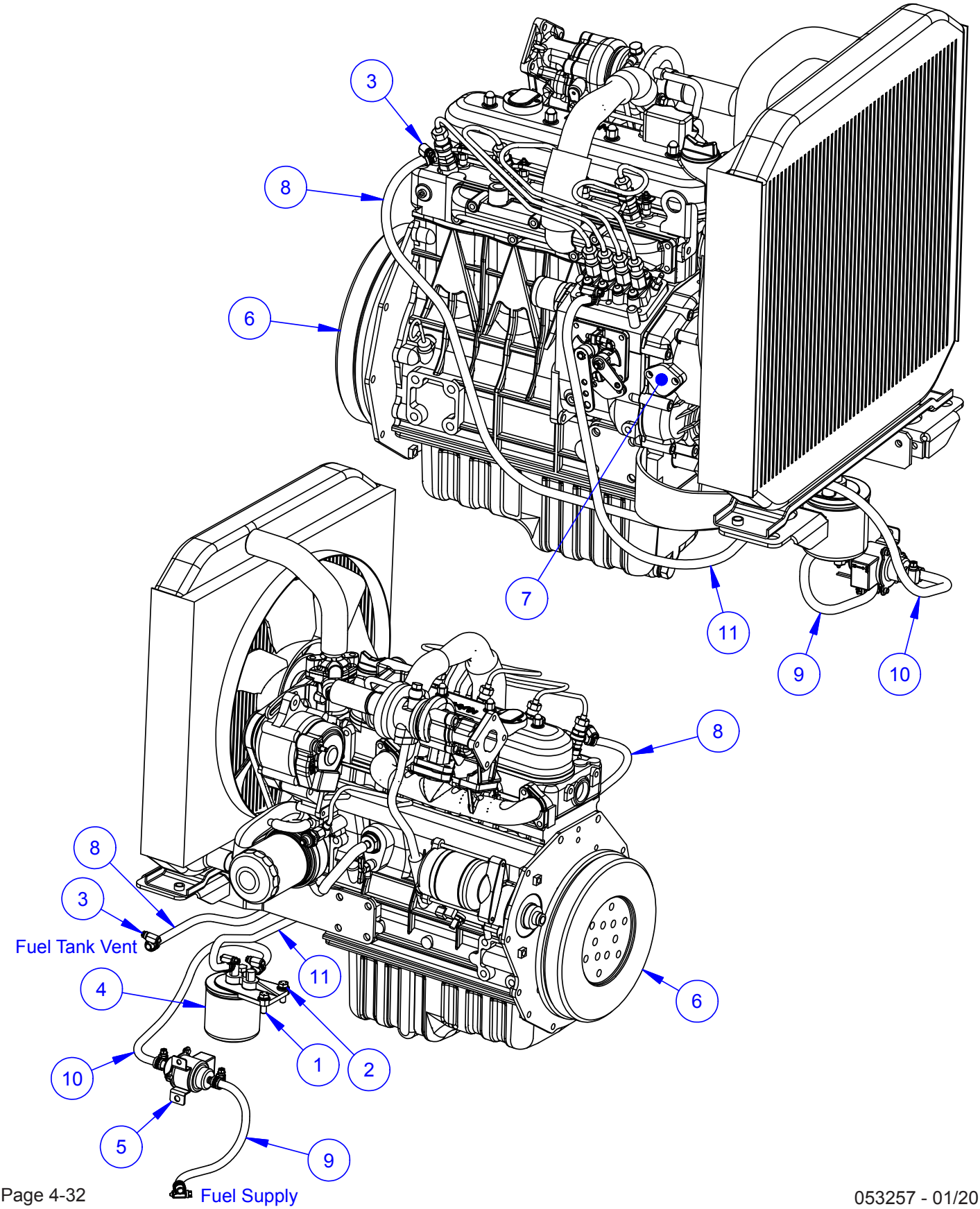
Mainframe Assembly Illustration



Mainframe Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010001	FSTN, HHCS 1/4-20 X 1/2 GR 5	2
2	010002	FSTN, HHCS 1/4-20 X 3/4	8
3	010019	FSTN, HHCS 5/16-18 X 3/4 GR 5	4
4	010035	FSTN, HHCS 3/8-16 X 3/4	10
5	010036	FSTN, HHCS 3/8-16 X 1	8
6	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	10
7	010073	FSTN, HHCS 1/2-13 X 2-1/2 GR 5	6
8	010081	FSTN, FW 1/4	16
9	010083	FSTN, FW 3/8	6
10	010089	*Varies*	18
11	010090	FSTN, LW 5/16	4
12	010091	FSTN, LW 3/8	18
13	010100	FSTN, NUT HEX 5/16-18	4
14	010464	FSTN, NUT NYLOK 3/8-16	14
15	010568	SCR, 10-32 X 1/2 RND HD MACH	8
16	010632	FSTN, HHCS 5/8-11 X 2 GR 8	1
17	011490	FSTN, FW HARDENED 1/2	6
18	012612	FSTN, NUT HEX NYLOCK 5/16-18	4
19	012702	TIP, 80°x0.10 GPM BRASS SPRAY	2
20	012994	RIVET, 1/8x3/8 ALUM DOME HD	4
21	015696	KEY, .25x1.25 LG HARD RAD	4
22	017314	SHCS, 1/4-20 X 5/8	16
23	017751	FSTN, FW HARD A325 3/8 (p)	8
24	020542	FSTN, NUT STOVER LOCK 1/4-20	8
25	029568	NUT, 10-32 NYLOCK HEX	8
26	032097	DECAL, SERIAL NUMBER PLATE	1
27	033735	PUMP, SPRAY SYSTEM	1
28	036881	LIGHT, 12 V WORK	2
29	037139	FSTN, NUT NYLOC 5/8-18 GR 8	6
30	038174	RIDER MANUAL PITCH CONTROL ASSY	2
31	039329	FSTN, CLIP TINNERMAN 1/4-20	4
32	040208	FSTN, 1/2-13 STOVER NUT	6
33	040209	FILTER, RETARDANT SPRAY SYSTEM	1
34	040330	PUMP, 12 V ELECTRONIC FUEL	1
35	040387	ELBOW, 3/8 BRASS 90° STREET	1
36	040388	FTG, 3/8X1/4 BRASS FM TO FM REDUCER	1
37	041510	DECAL, DIESEL ONLY CAP	1
38	041604	BODY, NYLON CHECK VALVE NOZ	2
39	041606	NIPPLE, 1/4 NPT CLOSE PLASTIC	2
40	041624	RETAINER, NYLON SPRAY TIP	2
41	042140	BRACKET, REAR LIGHT SP400B	2
42	042260	LATCH, T-HANDLE EXTRA-LARGE DRAW	2
43	042343	FSTN, SFBHCS 1/4”-20 x 3/4	4
44	043124	ROD, END MALE 5/8	3
45	043125	ROD END, 5/8 FEMALE	3
46	046744	MOUNT, VIB	6
47	047578	STRAINER, POLY 50 µ MESH	2
48	047636	HUB, Ø1.25 BORE GEARBOX SHAFT	4
49	047637	ASSY, U-JOINT TELESCOPING	2
50	047700	TANK, 6 GALLON WATER PLASTIC HD550	1
51	047933	ELBOW, 1/4 PUSHLOK x 1/4 NPT PLASTIC	3
52	048455	FSTN, HHCS 5/8-11 x 3 GR 8	5
53	048559	MNTG BLOCK, CROSSHEAD	4
54	048560	BEARING, Ø1 ID PLASTIC FLANGE	4
55	048627	SPACER, STEERING CONNECTION	10
56	048652	TEE, PLASTIC 1/4 x 1/4 x 1/4	1
57	048653	BARB, HOSE PLASTIC 1/4” x 1/4 NPT	1
58	048660	CYLINDER, 1.5x.625 STEERING	3
59	048921	STRAP, TANK	4
60	049036	CAP, 3-1/2” VENTED BLACK	1
61	053200	TANK ASSY, 6 GAL FUEL W/ CAP (EPA)	1
62	053445	DECAL, RETARDANT ONLY (SP)	1
63	056722	THROTTLE BRKT	1
64	056872	MODULE, 20:1 RH ROTOR ASSY	1
65	056888	UNDERCARRIAGE PAN	1
66	056893	MODULE, 20:1 LH ROTOR ASSY	1
67	059533	FOOT PEDAL W/ THROTTLE, RH	1
68	059535	FOOT PEDAL W/ KILL, LH	1
69	059544	FRONT COVER PLATE	1
70	060815	FRICTION TAPE, 4 X 10	1
71	060902	MAIN FRAME, MSP455	1
72	060908	RISER F/ PLATFORM	1
73	060910	DOOR WMNT	1
74	060914	HYD TANK WMNT	1

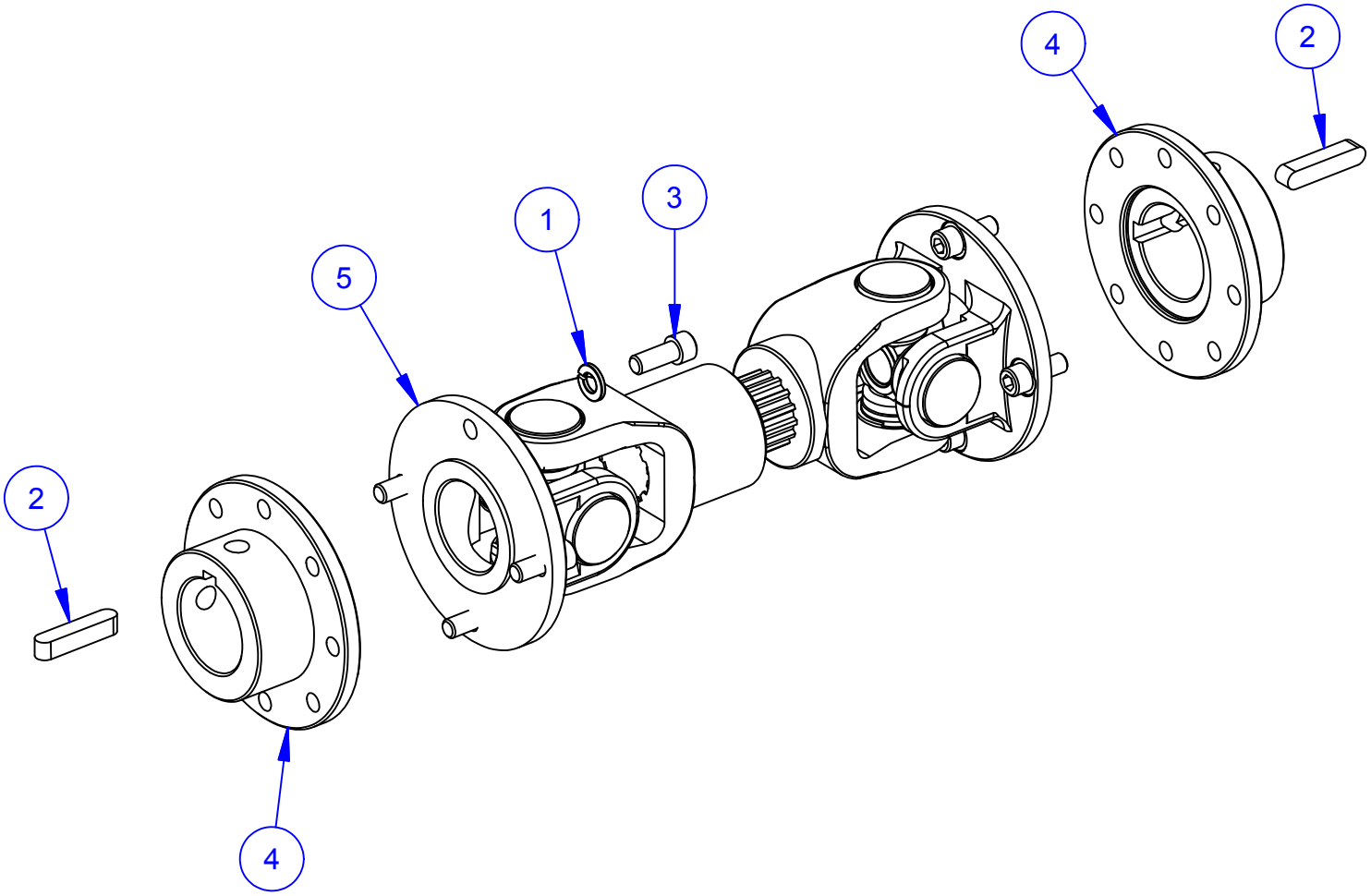
Fuel System Assembly Illustration



Fuel System Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010020	SCR, 5/16-18x1 HHC	2
2	010090	FSTN, LW 5/16	2
3	019430	FSTN, CLAMP SIZE 4 MINI	8
4	037777	ASSY, FUEL FILTER	1
5	040330	PUMP, 12 V ELECTRONIC FUEL	1
6	043291A	ENGINE, KUBOTA 44 TURBO V1505TEBB-1	1
7	046441	COVER, FUEL PUMP	1
8	HOSE-1	HOSE, 5/16” FUEL LINE (019429)	
9	HOSE-2	HOSE, 5/16” FUEL LINE (019429)	
10	HOSE-3	HOSE, 5/16” FUEL LINE (019429)	
11	HOSE-4	HOSE, 5/16” FUEL LINE (019429)	

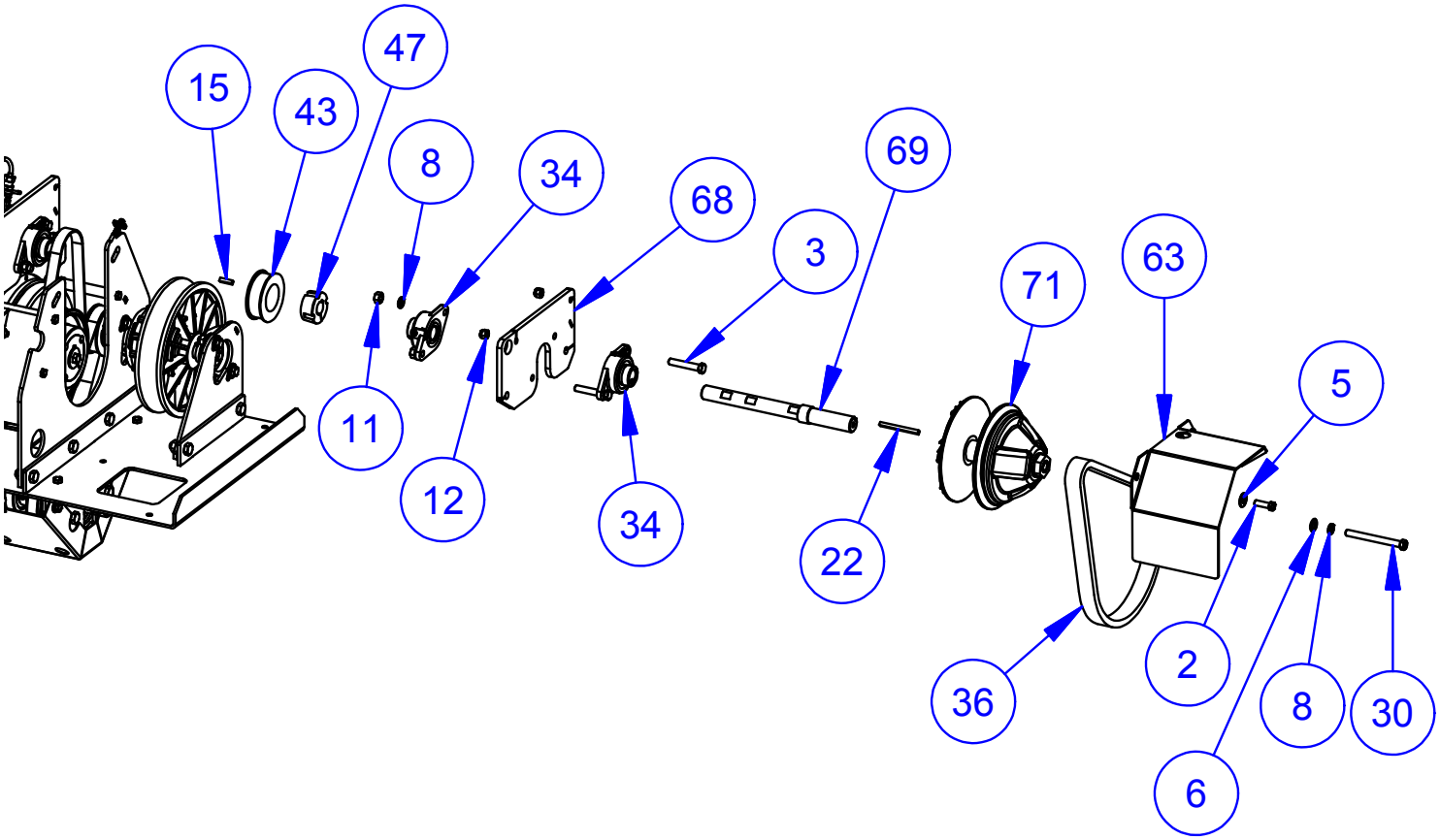
Driveline Turnbuckle Assembly Illustration



Driveline Turnbuckle Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010089	WSHR, Ø1/4 ID Z-STL SPLIT LOCK	8
2	015696	KEY, .25x1.25 LG HARD RAD	2
3	017314	SHCS, 1/4-20 X 5/8	8
4	047636	HUB, Ø1.25 BORE GEARBOX SHAFT	2
5	047637	ASSY, U-JOINT TELESCOPING	1

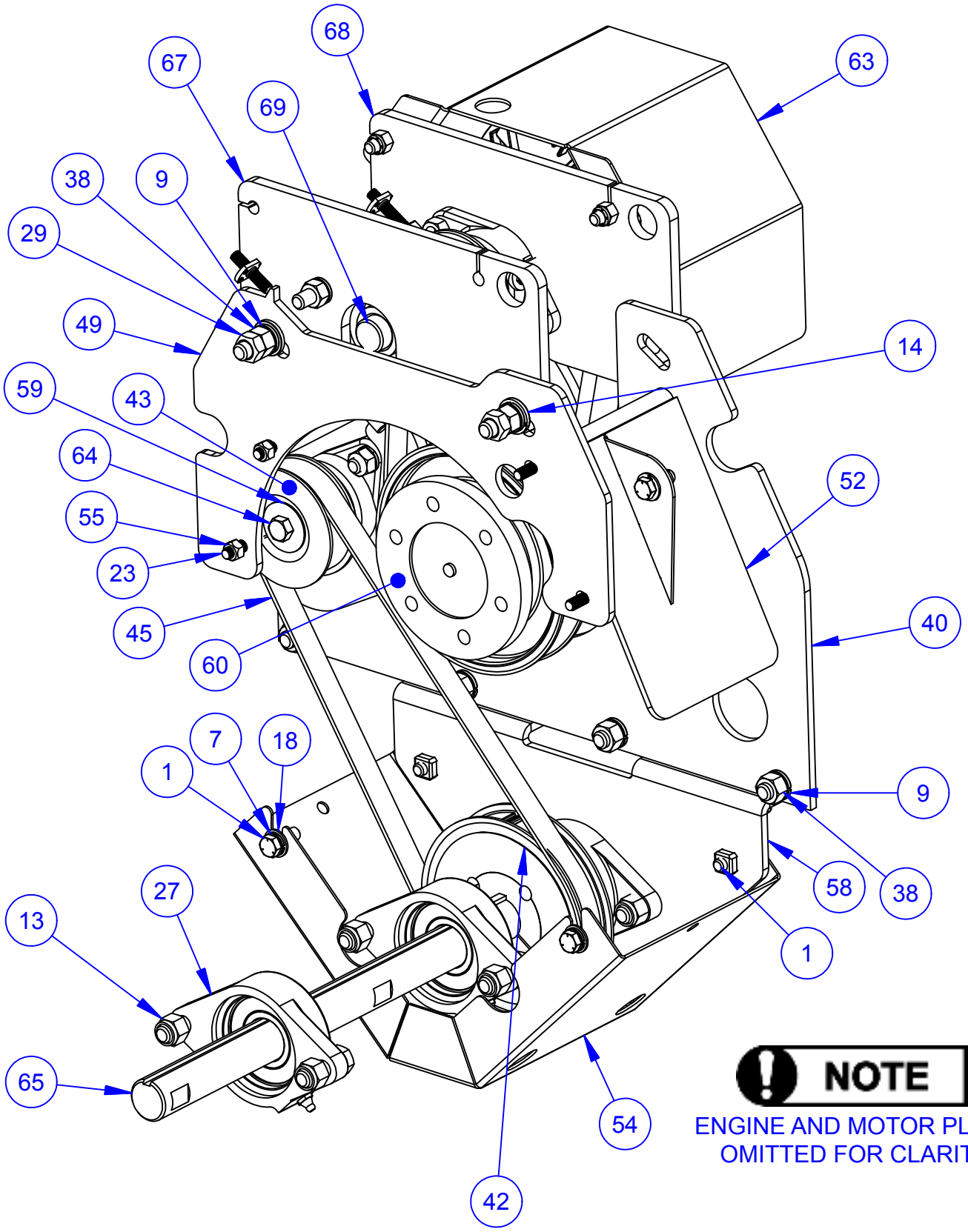
Power Drive Assembly Illustration



Power Drive Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010036	FSTN, HHCS 3/8-16 X 1	7
2	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	2
3	010058	FSTN, HHCS 7/16-14 X 2	2
4	010068	FSTN, HHCS 1/2-13 X 1-1/4 GR 5	4
5	010083	FSTN, FW 3/8	2
6	010084	FSTN, FW 7/16	1
7	010091	FSTN, LW 3/8	5
8	010092	FSTN, LW 7/16	10
9	010093	FSTN, LW 1/2	10
10	010102	FSTN, NUT HEX 3/8-16	1
11	010104	FSTN, HEX NUT 7/16-14	4
12	010464	FSTN, NUT NYLOK 3/8-16	4
13	011238	FSTN, NUT HEX NYLOK 1/2-13	6
14	011490	FSTN, FW HARDENED 1/2	16
15	011791	KEY, 1/4 SQ X 1 LG MACHINE	2
16	012612	FSTN, NUT HEX NYLOCK 5/16-18	2
17	013619	FSTN, HHCS 1/2-13 X 2-1/4 GR8	4
18	017751	FSTN, FW HARD A325 3/8 (p)	6
19	021072	FSTN, LW 10MM	16
20	024669	FSTN, HHCS 7/16-14 X 2	1
21	024820	STOCK, 1/4 SQx4 LG KEY	1
22	026992	KEY, 1/4 X 3 1/8” LONG	1
23	037763	SCR, M8 X 1.25 X 25 ZINC HEXHD CAP	1
24	037778	SCR, 10MMx1.25x30 HHC	8
25	037798	FSTN, HHCS 1/2-13 X 1 1/2 GR8	6
26	038508	FSTN, HHCS 1/2-13 X 1 1/4 GR 8	6
27	039130	BEARING ASS’Y	3
28	060929	BEARINGS,LCJT1 TIMKEN, 323494	2
29	040208	FSTN, 1/2-13 STOVER NUT	8
30	042280	SCR, 7/16-20x4-1/2 YZ GR 8 HHC	1
31	043291A	ENGINE, KUBOTA 44 TURBO V1505TEBB-1	1
32	043443	SCR, 10MMx1.25x30 HHC	8
33	045853	FSTN, HHCS 7/16-14 X 1 1/2” LONG GR 8	4
34	060929	BEARINGS,LCJT1 TIMKEN, 323494	3
35	049633	ENGINE MOUNT	4
36	051332	BELT, CVT	1
37	053389	PULLEY, MSP445, MP215	1
38	055040	FSTN, NUT HEX 1/2-13 GR8 YELLOW ZINC	10

Power Drive Assembly - cont'd
Illustration

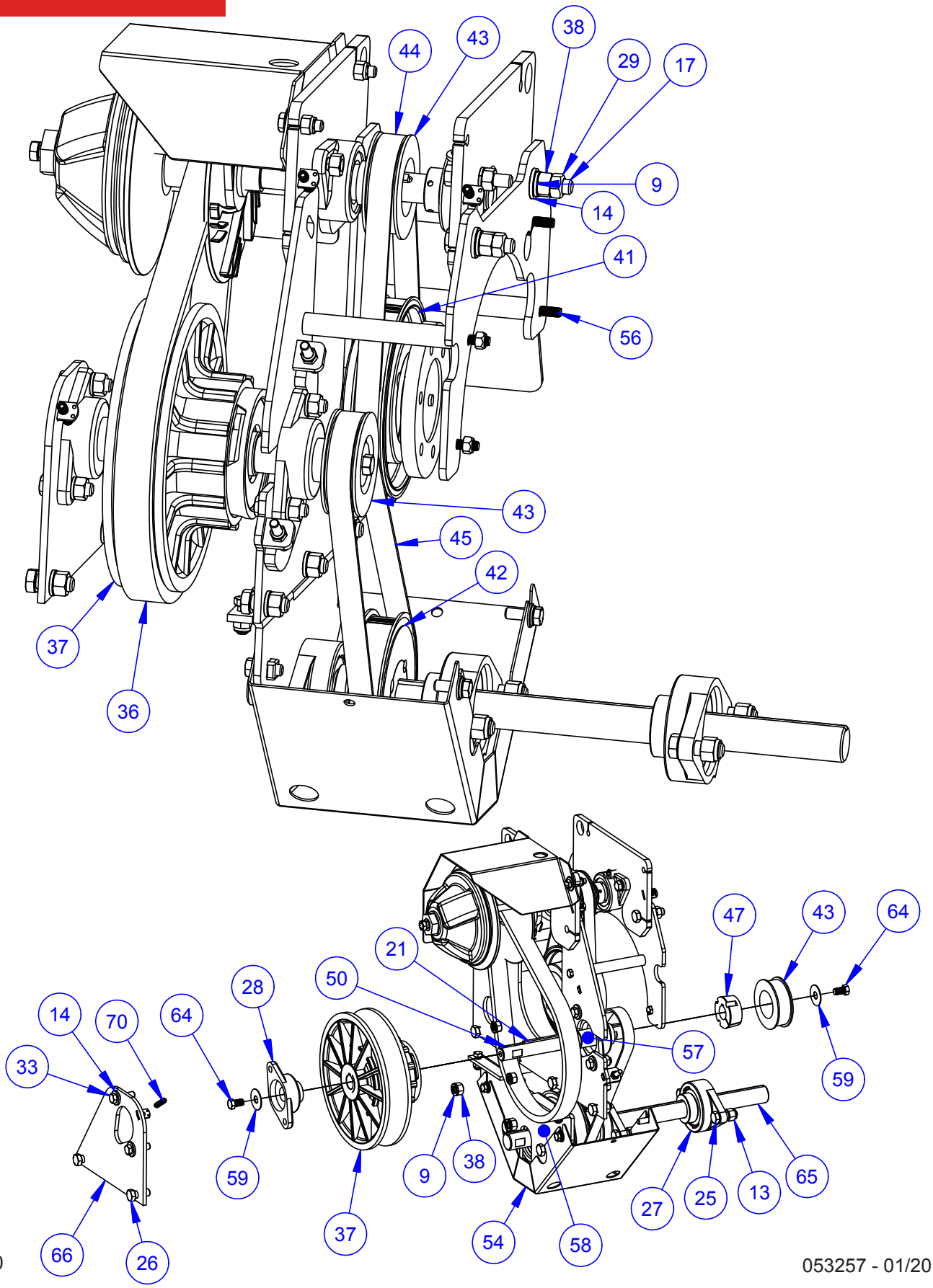


NOTE

ENGINE AND MOTOR PLATE
OMITTED FOR CLARITY

ITEM	PART NO.	DESCRIPTION	QTY
39	059763	FSTN, FW 1 1/4" GR 8 YELLOW ZINC	1
40	060806	BEARING SUPPORT WMNT, MIDDLE	1
41	060809	SPROCKET, POLYCHAIN, 8MX-67S-21	1
42	060810	SPROCKET, POLYCHAIN, 8mx-56s-21	1
43	060811	SPROCKET, POLYCHAIN, 8MX-33S-21	2
44	060812	BELT, POLYCHAIN, 8MGT-800-21	1
45	060813	BELT, POLYCHAIN,8MGT-1000-21	1
46	060817	TAPER LOCK, 1 7/16"	1
47	060819	TAPER LOCK 1610 X 1-KW	2
48	060820	TAPER LOCK, 1 1/4'	1
49	060823	BEARING SUPPORT PLATE	1
50	060827	SHAFT, KEYED AND TAPPED, 1" X 9 5/8"	1
51	060829	SPACER TUBE, 3/4 X 5 1/2	1
52	060836	HEAT SHIELD WMNT	1
53	060853	ENGINE PLATE ASS'Y	1
54	060856	BELT GUARD	1
55	060860	LOCK NUT 8MM	2
56	060861	HHCS 8MM X 170MM	3
57	060863	SPACER, BEARING, 1 3/16"	1
58	060864	BEARING SUPPORT WMNT, REMOVABLE	1
59	060865	WASHER, LARGE OD	3
60	060866	STUB SHAFT, 1 7/16", SHORT	1
61	060867	KEY, RND END, 3/8 SQ X 1 1/2	1
62	060868	HEX NUT, 7/16-14 GR8	4
63	060869	CLUTCH COVER, MSP450	1
64	060870	HHCS, 7/16-20 X 3/4	3
65	060872	DRIVE SHAFT	1
66	060876	BEARING SUPPT WMNT, SHORT	1
67	060925	BEARING PLATE WMNT, UPPER FRONT	1
68	060926	BEARING PLATE WMNT, UPPER REAR	1
69	061446	SHAFT CVT, MSP 450/470,1.123" X 12"	1
70	060956	SOCKET HEAD SET SCREW, 5/16-18 X 1 1/2	3
71	060961	PULLEY, MSP450 20:1 DRIVER	1
72	061247	ADJUSTER, BEARING	1
73	099030	KEY, 1/4" SQ X 2 1/4" LONG	1

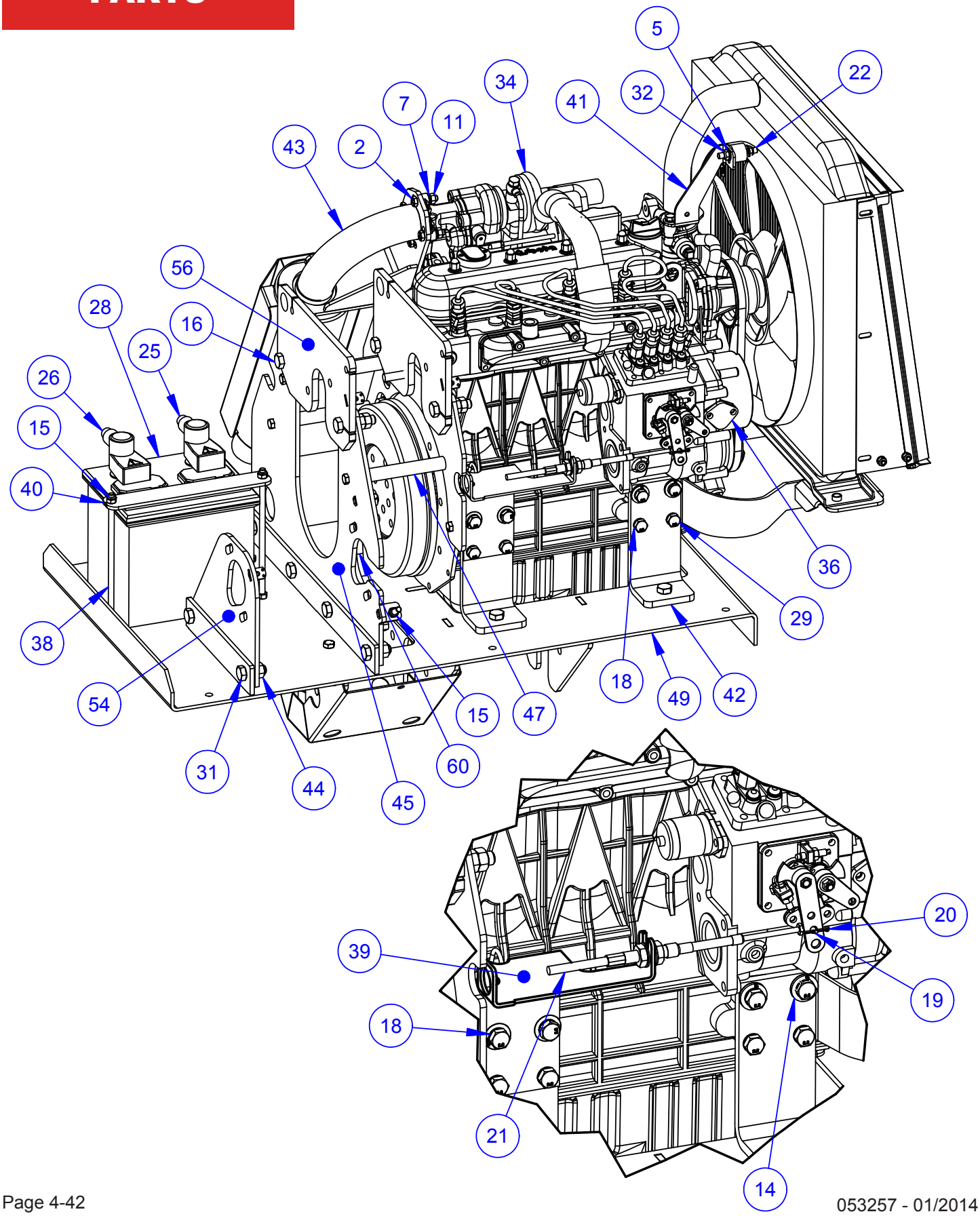
Power Drive Assembly - cont'd
Illustration



Power Drive Assembly - cont'd
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010036	FSTN, HHCS 3/8-16 X 1	7
2	010037	FSTN, HHCS 3/8-16 X 1-1/4 GR 5	2
3	010058	FSTN, HHCS 7/16-14 X 2	2
4	010068	FSTN, HHCS 1/2-13 X 1-1/4 GR 5	4
5	010083	FSTN, FW 3/8	2
6	010084	FSTN, FW 7/16	1
7	010091	FSTN, LW 3/8	5
8	010092	FSTN, LW 7/16	10
9	010093	FSTN, LW 1/2	10
10	010102	FSTN, NUT HEX 3/8-16	1
11	010104	FSTN, HEX NUT 7/16-14	4
12	010464	FSTN, NUT NYLOK 3/8-16	4
13	011238	FSTN, NUT HEX NYLOK 1/2-13	6
14	011490	FSTN, FW HARDENED 1/2	16
15	011791	KEY, 1/4 SQ X 1 LG MACHINE	2
16	012612	FSTN, NUT HEX NYLOCK 5/16-18	2
17	013619	FSTN, HHCS 1/2-13 X 2-1/4 GR8	4
18	017751	FSTN, FW HARD A325 3/8 (p)	6
19	021072	FSTN, LW 10MM	16
20	024669	FSTN, HHCS 7/16-14 X 2	1
21	024820	STOCK, 1/4 SQx4 LG KEY	1
22	026992	KEY, 1/4 X 3 1/8" LONG	1
23	037763	SCR, M8 X 1.25 X 25 ZINC HEXHD CAP	1
24	037778	SCR, 10MMx1.25x30 HHC	8
25	037798	FSTN, HHCS 1/2-13 X 1 1/2 GR8	6
26	038508	FSTN, HHCS 1/2-13 X 1 1/4 GR 8	6
27	039130	BEARING ASS'Y	3
28	060929	BEARINGS,LCJT1 TIMKEN, 323494	2
29	040208	FSTN, 1/2-13 STOVER NUT	8
30	042280	SCR, 7/16-20x4-1/2 YZ GR 8 HHC	1
31	043291A	ENGINE, KUBOTA 44 TURBO V1505TEBB-1	1
32	043443	SCR, 10MMx1.25x30 HHC	8
33	045853	FSTN, HHCS 7/16-14 X 1 1/2" LONG GR 8	4
34	060929	BEARINGS,LCJT1 TIMKEN, 323494	3
35	049633	ENGINE MOUNT	4
36	051332	BELT, CVT	1
37	053389	PULLEY, MSP445, MP215	1
38	055040	FSTN, NUT HEX 1/2-13 GR8 YELLOW ZINC	10

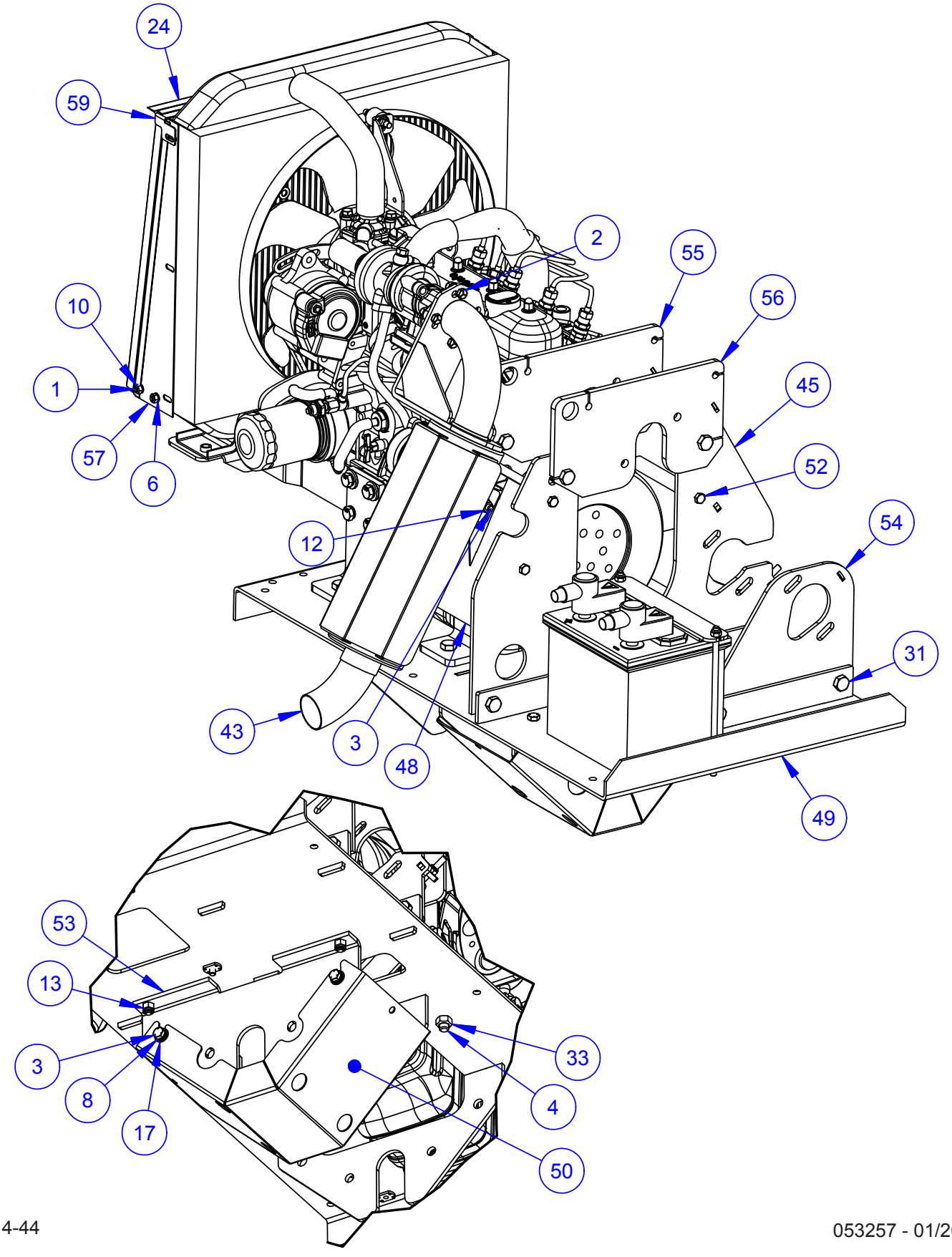
Engine Mounting Assembly Illustration



Engine Mounting Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010001	FSTN, HHCS 1/4-20 X 1/2 GR 5	4
2	010021	FSTN, HHCS 5/16-18 X 1-1/4 GR5	4
3	010036	FSTN, HHCS 3/8-16 X 1	7
4	010068	FSTN, HHCS 1/2-13 X 1-1/4 GR 5	4
5	010082	FSTN, FW 5/16	3
6	010089	FSTN, LW 1/4	4
7	010090	FSTN, LW 5/16	4
8	010091	FSTN, LW 3/8	5
9	010093	FSTN, LW 1/2	10
10	010098	FSTN, NUT HEX 1/4-20	4
11	010100	FSTN, NUT HEX 5/16-18	6
12	010102	FSTN, NUT HEX 3/8-16	1
13	010464	FSTN, NUT NYLOK 3/8-16	2
14	011490	FSTN, FW HARDENED 1/2	12
15	012612	FSTN, NUT HEX NYLOCK 5/16-18	4
16	013619	FSTN, HHCS 1/2-13 X 2-1/4 GR8	4
17	017751	FSTN, FW HARD A325 3/8 (p)	6
18	021072	FSTN, LW 10MM	16
19	024984	PIVOT, THROTTLE CABLE	1
20	026226	PIN, Ø3/32 X 3/4 ZP STL COTTER	1
21	028243	THROTTLE CABLE, 52” LONG	1
22	028556	ISOLATOR, 25MM X 20MM “A” BUFFER	1
23	029032	FSTN, LW 8MM	2
24	034368	WEATHER STRIP, FINGER STYLE	2
25	035597	INSULATOR, POS BATT TERMINAL	1
26	035598	INSULATOR, NEG BATT TERMINAL	1
27	037763	SCR, M8 X 1.25 X 25 ZINC HEXHD CAP	1
28	037771	BATTERY, 12 V GRAY 655CA	1
29	037778	SCR, 10MMx1.25x30 HHC	8
30	037820	8MM x 1.25 x 30MM HHCS	2
31	038508	FSTN, HHCS 1/2-13 X 1 1/4 GR 8	6
32	040004	FSTN, 5/16-18 GR-C STOVER HEX NUT	2
33	040208	FSTN, 1/2-13 STOVER NUT	8
34	043291A	ENGINE, KUBOTA 44 TURBO V1505TEBB-1	1
35	043443	SCR, 10MMx1.25x30 HHC	8
36	046441	COVER, FUEL PUMP	1
37	047273	CUSHION F/ BATTERY STRAP	1
38	047715	ROD, 5/16-18 BATTERY RETAINER 8-5/8”	2

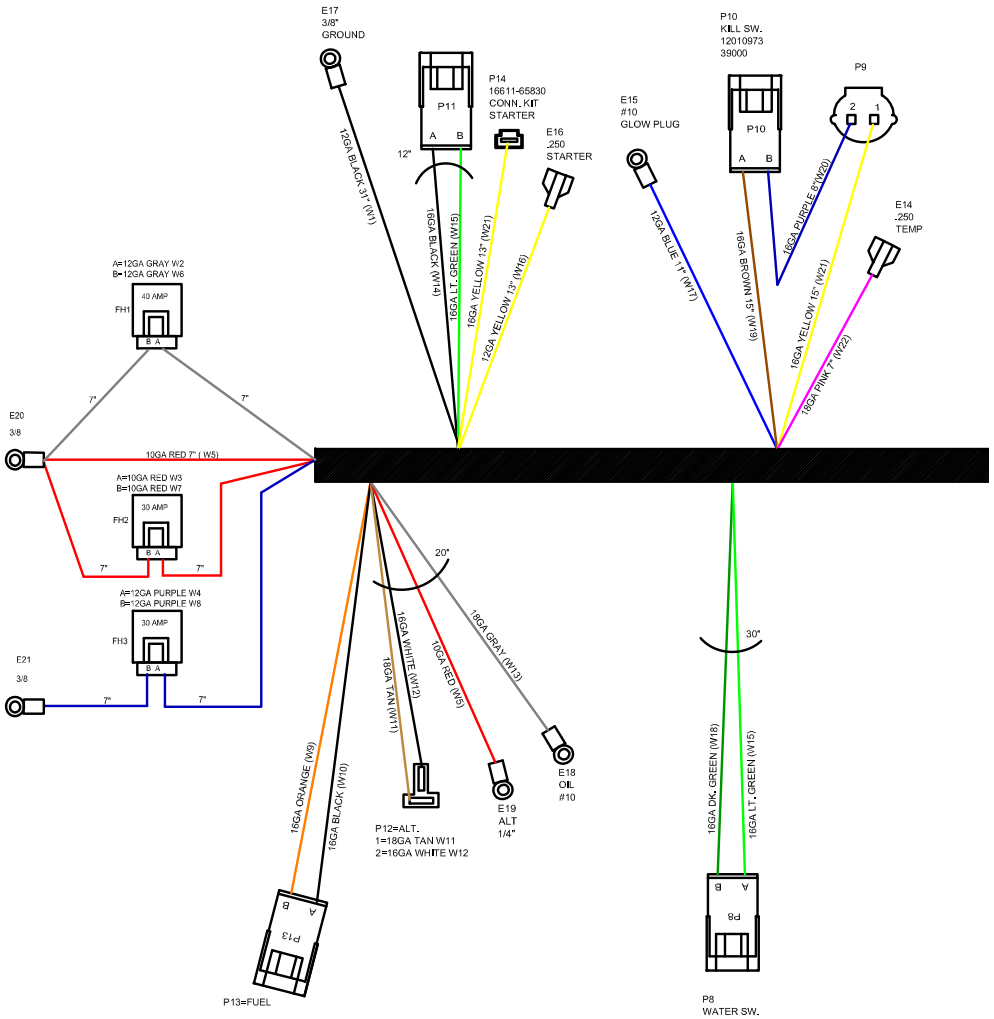
Engine Mounting Assembly - cont'd
Illustration



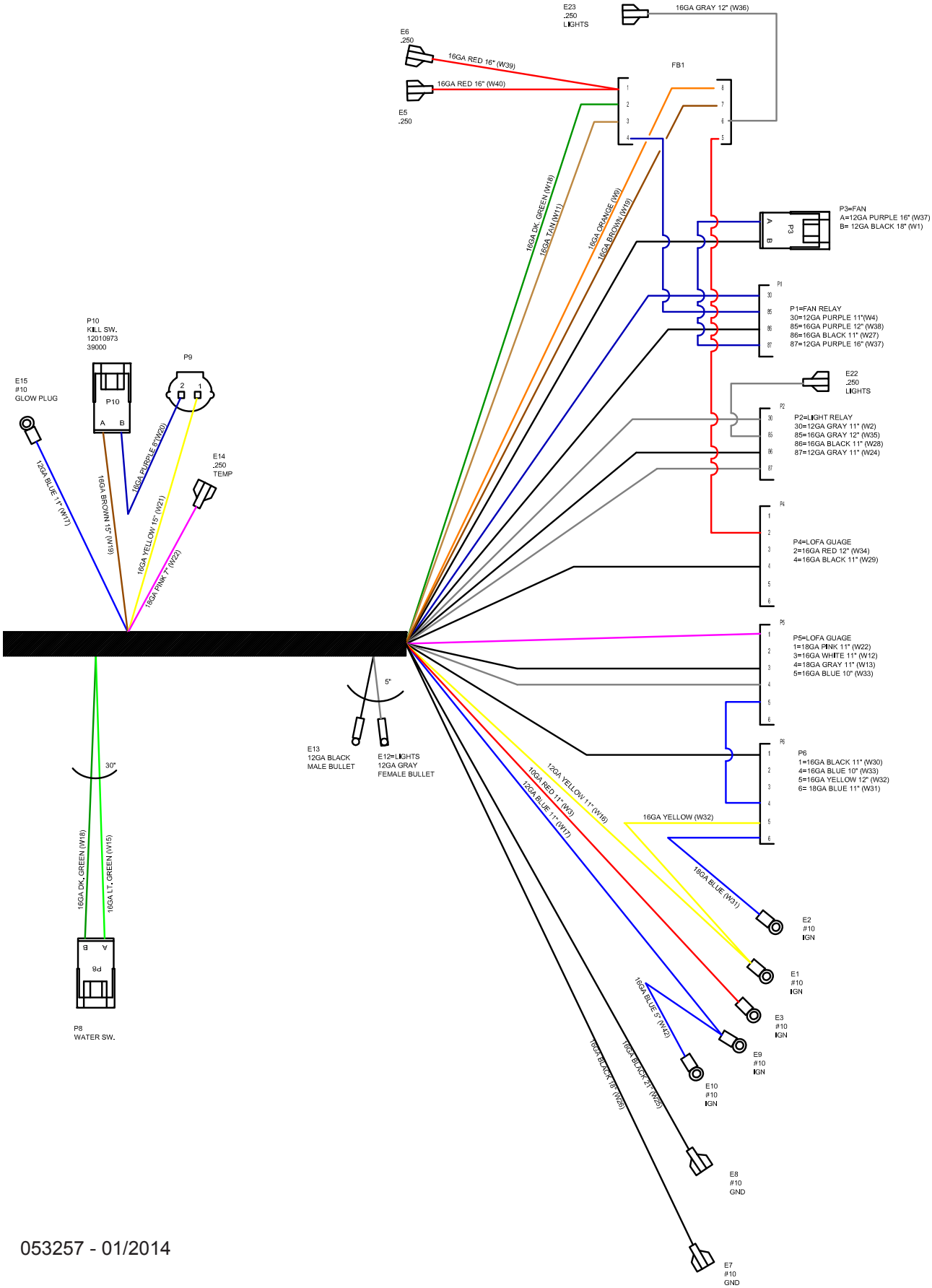
Engine Mounting Assembly - cont'd
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
39	048635	BRACKET, THROTTLE X1	1
40	048932	BAR, BATTERY HOLD DOWN	1
41	049028	BRACKET, RAD SUPPORT MSP460	1
42	049633	ENGINE MOUNT	4
43	049647	MUFFLER	1
44	055040	FSTN, NUT HEX 1/2-13 GR8 YELLOW ZINC	10
45	060806	BEARING SUPPORT WMNT, MIDDLE	1
46	060823	BEARING SUPPORT PLATE	1
47	060829	SPACER TUBE, 3/4 X 5 1/2	1
48	060836	HEAT SHIELD WMNT	1
49	060853	ENGINE PLATE ASS'Y	1
50	060856	BELT GUARD	1
51	060860	LOCK NUT 8MM	2
52	060861	HHCS 8MM X 170MM	3
53	060864	BEARING SUPPORT WMNT, REMOVABLE	1
54	060876	BEARING SUPPT WMNT, SHORT	1
55	060925	BEARING PLATE WMNT, UPPER FRONT	1
56	060926	BEARING PLATE WMNT, UPPER REAR	1
57	060973	SIDE RADIATOR SHROUD	2
58	060974	BOTTOM RADIATOR SHROUD	1
59	060976	UPPER RADIATOR SHROUD	1
60	061247	ADJUSTER, BEARING	1

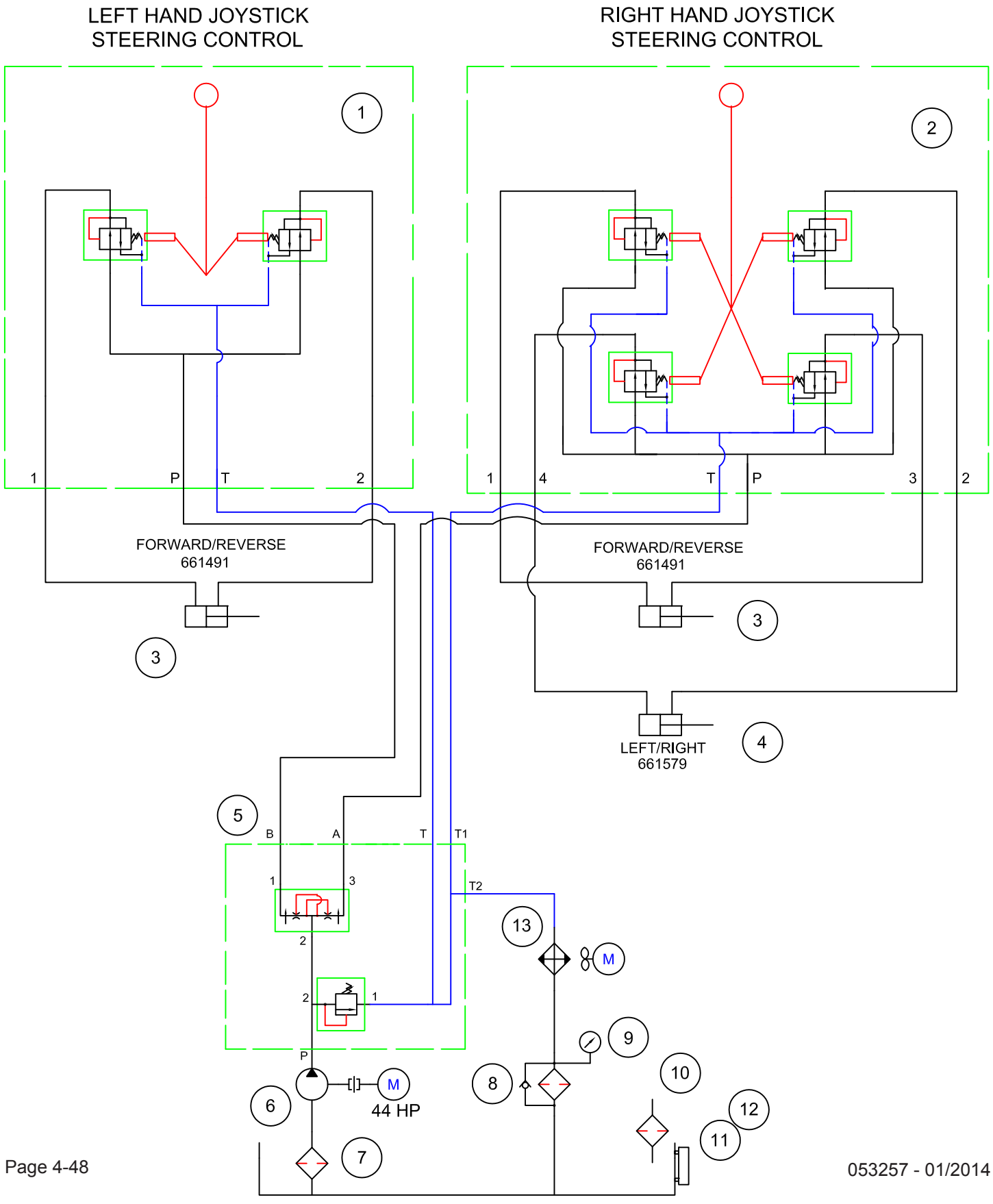
Electrical Schematic Illustration



Electrical Schematic Illustration



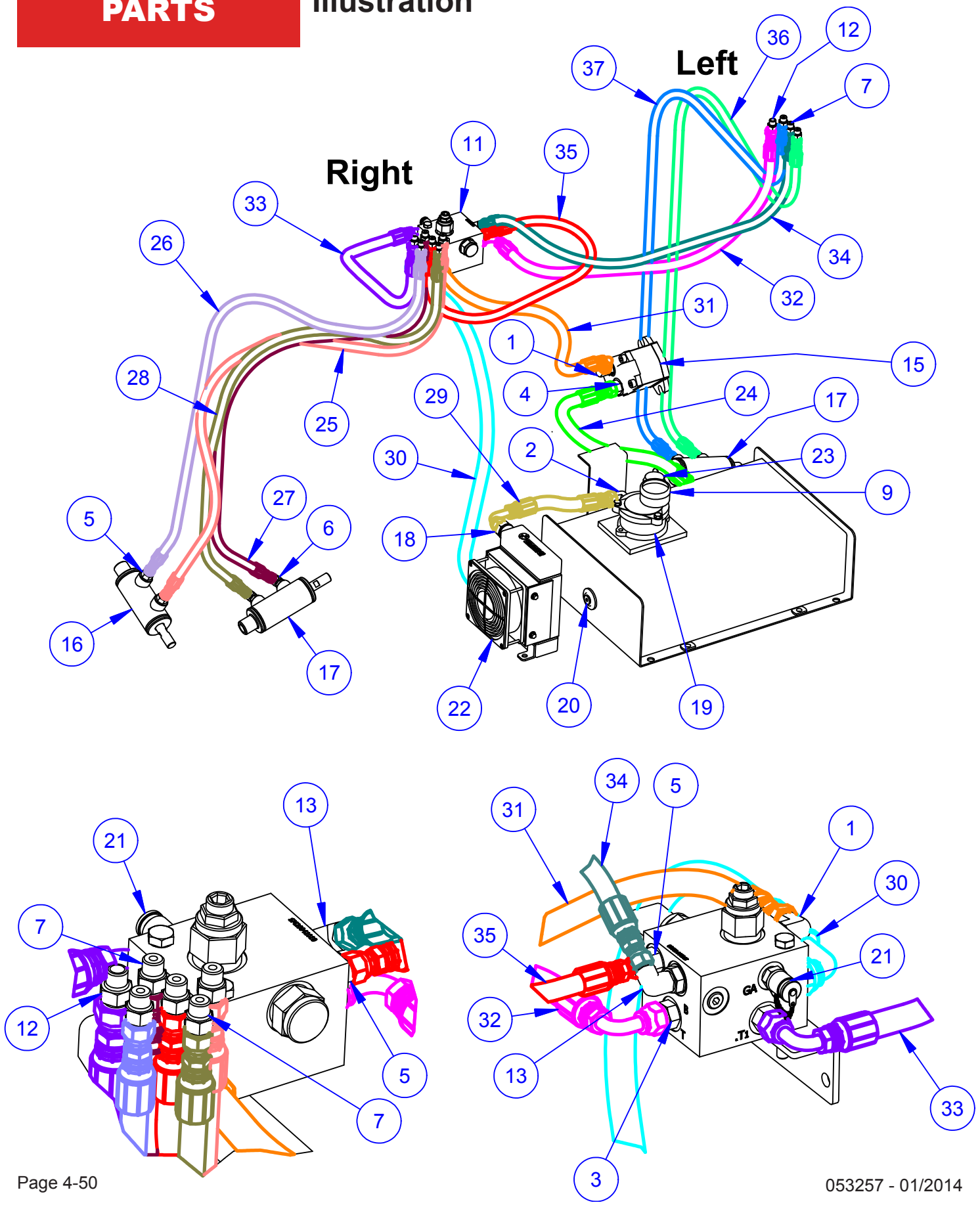
Hydraulic Schematic Illustration



Hydraulic Schematic Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	046737	CONTROL VALVE, LH SINGLE AXIS	1
2	046736	CONTROL VALVE, RH DUAL AXIS	1
3	048661	CYLINDER, 1.5x1.25 STEERING	2
4	048660	CYLINDER, 1.5x.625 STEERING	1
5	046735	MANIFOLD, 1200C HYD STEERING	1
6	048658	PUMP, AUXILLARY X1	1
7	046732	SUCTION STRAINER TMF-02-06	1
8	049978	FILTER, 1/2NPT 20M NOMINAL ELEMENT	1
9	046241	FILTER GAUGE	1
10	FI0350	FILLER BREATHER F/ RESERVOIR B-16	1
11	056932	GAUGE 76MM 3” LEVEL GAUGE	1
12	045948	FTG, 7574051 MAGNETIC #12 PLUG	1
13	052930	COOLER, AIR/OIL 2005K-12S-BP	1

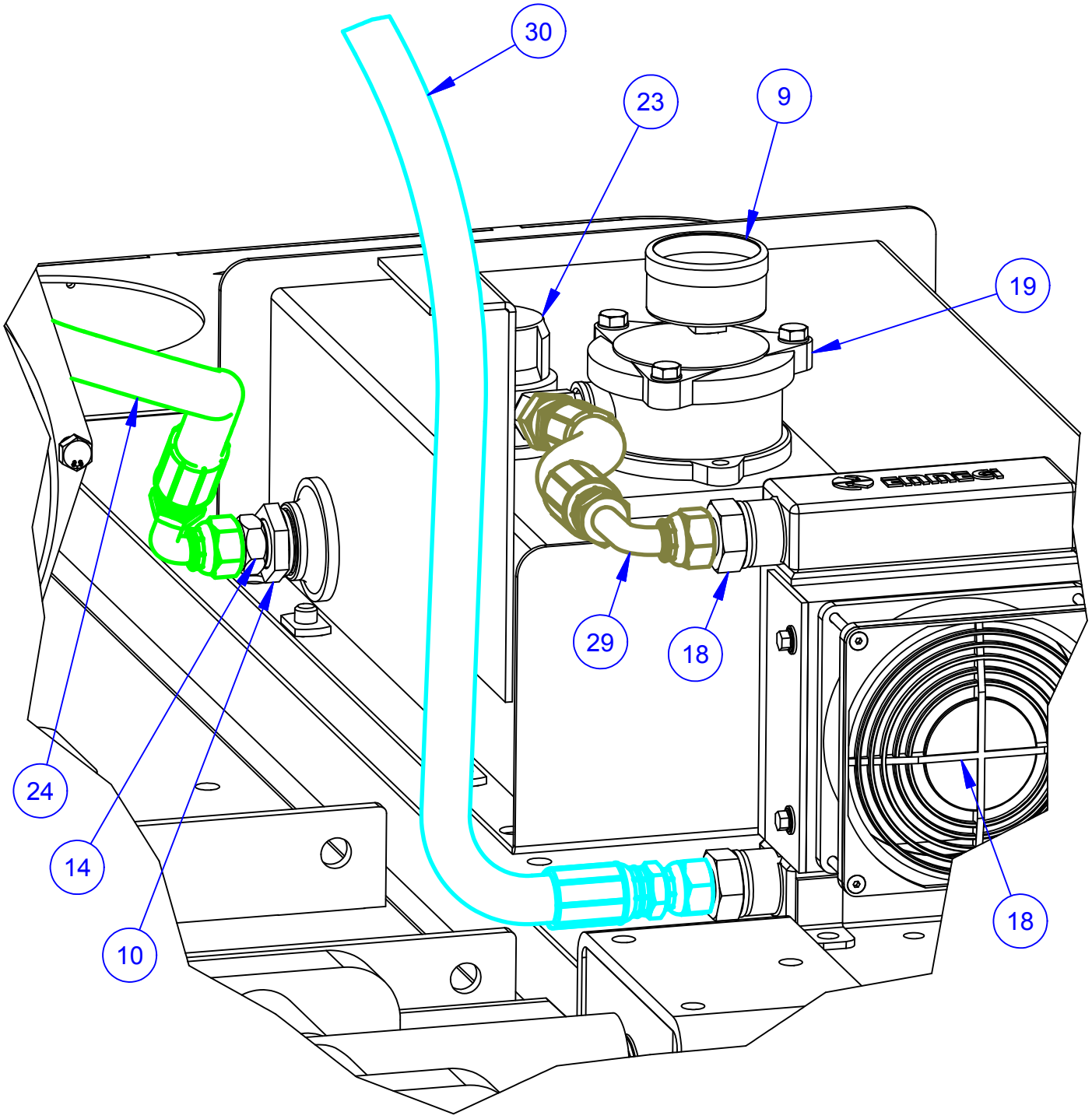
Hydraulic Assembly Illustration



Hydraulic Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	040080	FTG, MJIC X MSAE ADJ (6-6 90°)	2
2	042814	FITTING, #8JICMX1/2MPT 90 FLARE-O	1
3	045915	FTG, F6400-6-6-O STR JIC-SAE	2
4	045921	FTG, F6400-8-8-O STR JIC-SAE	2
5	045922	FTG, F6400-4-6-O STR JIC-SAE	5
6	045923	FTG, F6801-4-6-NWO 90° ELB JIC-SAE	2
7	045928	FTG, F6400-4-4-O STR JIC-SAE	8
8	045948	FITTING, 7574051 MAGNETIC PLUG	1
9	046241	GAUGE, RETURN FILTER	1
10	046732	SUCTION STRAINER TMF-02-06	1
11	046735	MANIFOLD, 1200C HYD STEERING	1
12	046777	FTG, F6400-6-4-O STR JIC-SAE	2
13	046891	FTG, 6801-4-6-NWO 90° ELB	1
14	047518	FTG, F2404-8-8	1
15	048658	PUMP, AUXILLARY X1	1
16	048660	CYLINDER, 1.5x.625 STEERING	1
17	048661	CYLINDER, 1.5x1.25 STEERING	2
18	049059	FTG, 9002-8-8 STR JIC-BSPP	2
19	049978	FILTER, 1/2NPT 20M NOMINAL ELEMENT	1
	039664	FILTER ELEMENT HYD. OIL	AS REQ
20	052902	FITTING, HYDRAULIC 6409-8	1
21	052926	FTG, HYD SMK20-7/16UNF-VE TEST PORT	1
22	052930	COOLER, AIR/OIL 2005K-12S-BP	1
23	056421	FILLER BREATHER	1
24	HS-470-1	HOSE, HYDRAULIC TANK TO AUX PUMP	1
25	HS-470-10	HOSE, #3 PORT RH JOYSTICK TO PISTON SIDE OF L/R CYLINDER	1
26	HS-470-11	HOSE, #1 PORT RH JOYSTICK TO ROD SIDE OF L/R CYLINDER	1
27	HS-470-12	HOSE, #2 PORT RH JOYSTICK TO ROD SIDE OF F/R CYLINDER	1
28	HS-470-13	HOSE, #4 PORT RH JOYSTICK TO PISTON SIDE OF F/R CYLINDER	1
29	HS-470-14	HOSE, TOP OF COOLER TO TOP OF TANK	1
30	HS-470-2	HOSE, T2 PORT ON MANIFOLD TO BOTTOM OF COOLER	1
31	HS-470-3	HOSE, P PORT ON MANIFOLD TO AUX PUMP	1
32	HS-470-4	HOSE, T PORT LH JOYSTICK TO MANIFOLD T PORT	1
33	HS-470-5	HOSE, T PORT RH JOYSTICK TO MANIFOLD T1 PORT	1
34	HS-470-6	HOSE, B PORT ON MANIFOLD TO LH JOYSTICK P PORT	1
35	HS-470-7	HOSE, A PORT ON MANIFOLD TO RH JOYSTICK P PORT	1
36	HS-470-8	HOSE, #4 PORT LH JOYSTICK TO PISTON SIDE OF F/R CYLINDER	1
37	HS-470-9	HOSE, #2 PORT LH JOYSTICK TO ROD SIDE OF F/R CYLINDER	1

Hydraulic Assembly - cont'd
Illustration



Hydraulic Assembly - cont'd
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	040080	FTG, MJIC X MSAE ADJ (6-6 90°)	2
2	042814	FITTING, #8JICMX1/2MPT 90 FLARE-O	1
3	045915	FTG, F6400-6-6-O STR JIC-SAE	2
4	045921	FTG, F6400-8-8-O STR JIC-SAE	2
5	045922	FTG, F6400-4-6-O STR JIC-SAE	5
6	045923	FTG, F6801-4-6-NWO 90° ELB JIC-SAE	2
7	045928	FTG, F6400-4-4-O STR JIC-SAE	8
8	045948	FITTING, 7574051 MAGNETIC PLUG	1
9	046241	GAUGE, RETURN FILTER	1
10	046732	SUCTION STRAINER TMF-02-06	1
11	046735	MANIFOLD, 1200C HYD STEERING	1
12	046777	FTG, F6400-6-4-O STR JIC-SAE	2
13	046891	FTG, 6801-4-6-NWO 90° ELB	1
14	047518	FTG, F2404-8-8	1
15	048658	PUMP, AUXILLARY X1	1
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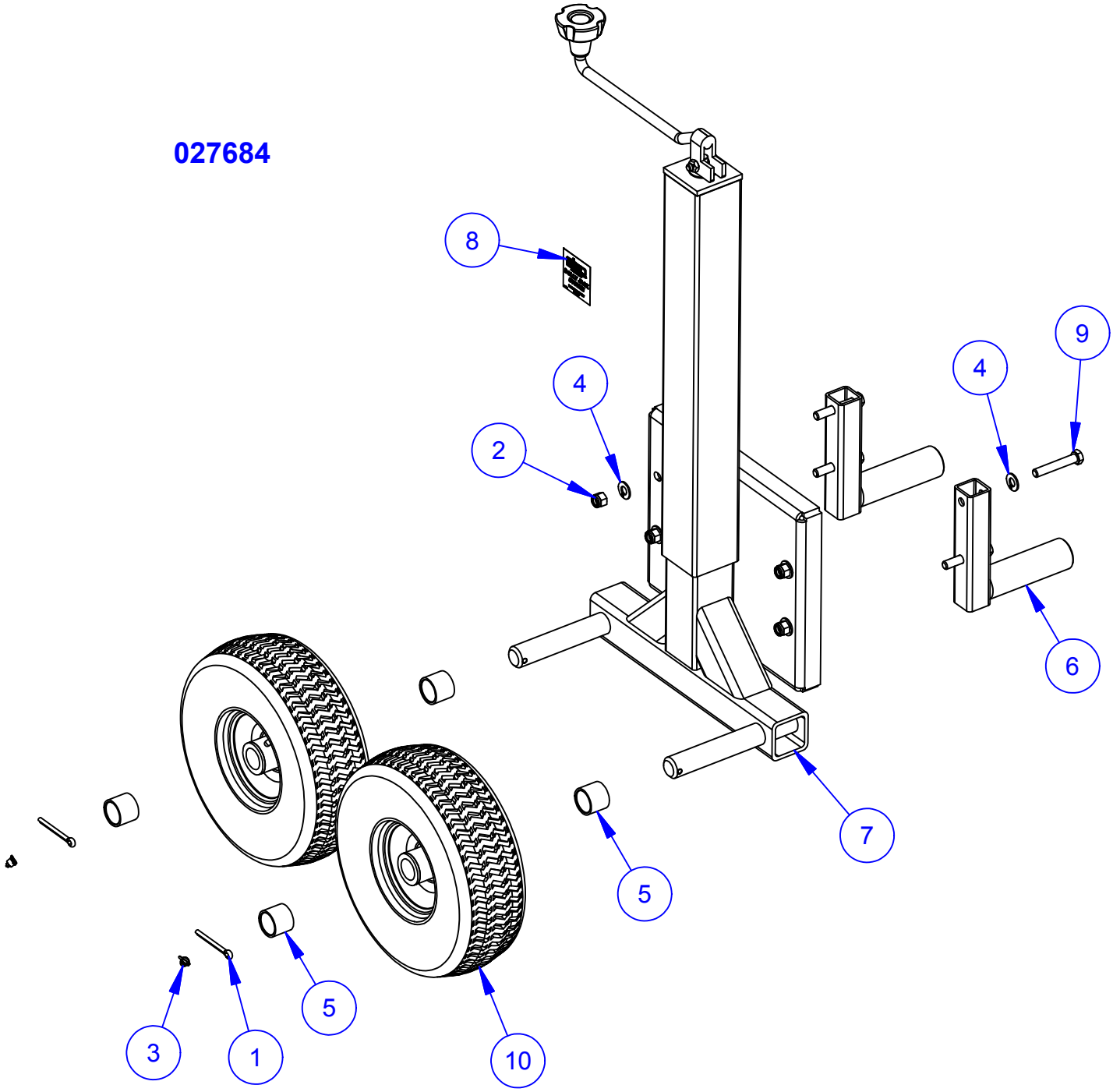
18	049059	FTG, 9002-8-8 STR JIC-BSPP	2
19	049978	FILTER, 1/2NPT 20M NOMINAL ELEMENT	1
	039664	FILTER ELEMENT HYD. OIL	AS REQ
20	052902	FITTING, HYDRAULIC 6409-8	1
21	052926	FTG, HYD SMK20-7/16UNF-VE TEST PORT	1
22	052930	COOLER, AIR/OIL 2005K-12S-BP	1
23	056421	FILLER BREATHER	1
24	HS-470-1	HOSE, HYDRAULIC TANK TO AUX PUMP	1
25	HS-470-10	HOSE, #3 PORT RH JOYSTICK TO PISTON SIDE OF L/R CYLINDER	1
26	HS-470-11	HOSE, #1 PORT RH JOYSTICK TO ROD SIDE OF L/R CYLINDER	1
27	HS-470-12	HOSE, #2 PORT RH JOYSTICK TO ROD SIDE OF F/R CYLINDER	1
28	HS-470-13	HOSE, #4 PORT RH JOYSTICK TO PISTON SIDE OF F/R CYLINDER	1
29	HS-470-14	HOSE, TOP OF COOLER TO TOP OF TANK	1
30	HS-470-2	HOSE, T2 PORT ON MANIFOLD TO BOTTOM OF COOLER	1
31	HS-470-3	HOSE, P PORT ON MANIFOLD TO AUX PUMP	1
32	HS-470-4	HOSE, T PORT LH JOYSTICK TO MANIFOLD T PORT	1
33	HS-470-5	HOSE, T PORT RH JOYSTICK TO MANIFOLD T1 PORT	1
34	HS-470-6	HOSE, B PORT ON MANIFOLD TO LH JOYSTICK P PORT	1
35	HS-470-7	HOSE, A PORT ON MANIFOLD TO RH JOYSTICK P PORT	1
36	HS-470-8	HOSE, #4 PORT LH JOYSTICK TO PISTON SIDE OF F/R CYLINDER	1
37	HS-470-9	HOSE, #2 PORT LH JOYSTICK TO ROD SIDE OF F/R CYLINDER	1

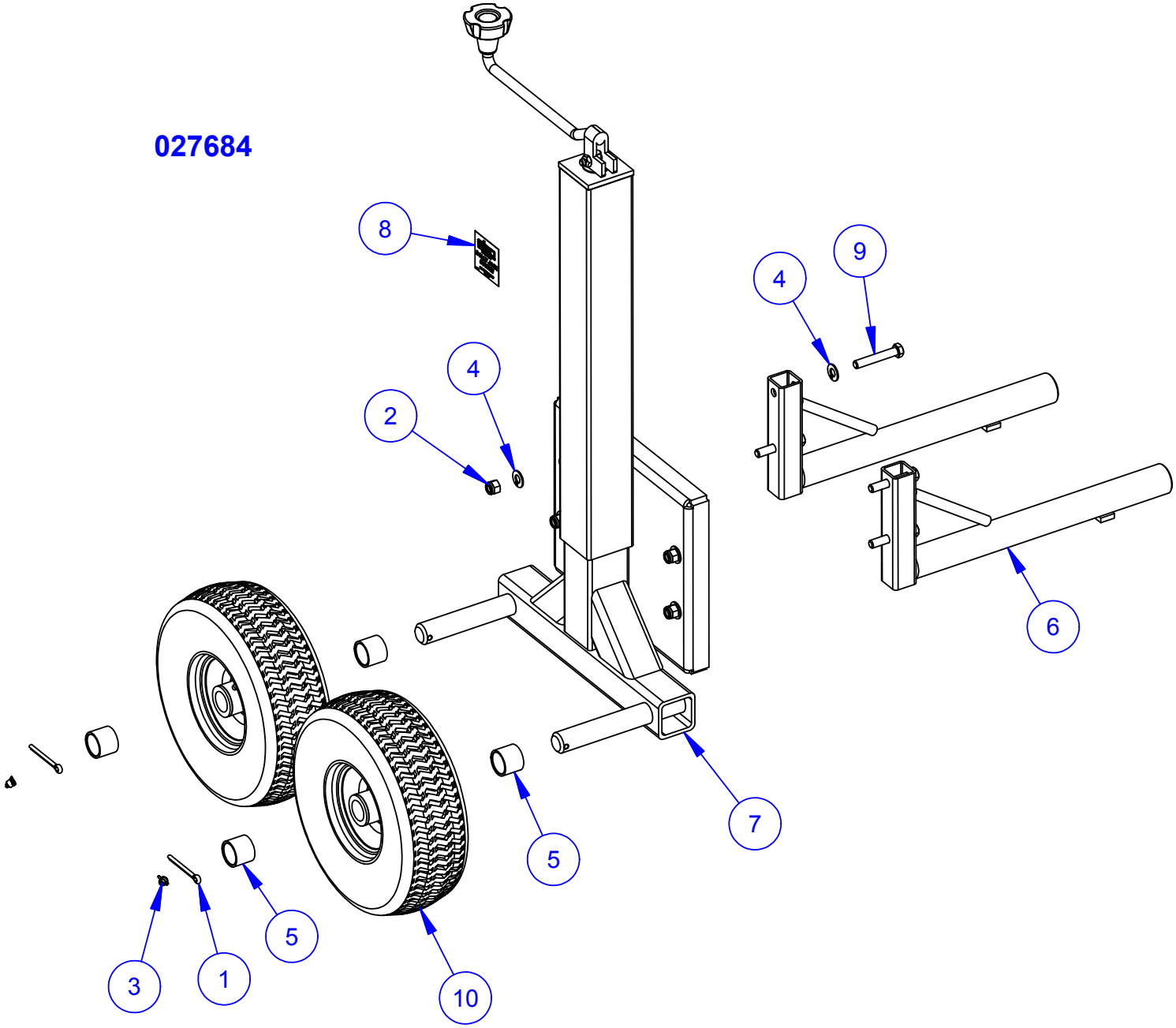
Front Dolly Jack Assembly Illustration



Front Dolly Jack Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010133	PIN, 3/16 X 2 COTTER	2
2	010464	FSTN, NUT NYLOK 3/8-16	4
3	015692	CAP, Ø1/4 RED GREASE	2
4	017751	FSTN, FW HARD A325 3/8 (p)	8
5	024628	SPACER, DOLLY JACK	4
6	026729	LIFT, FRONT DOLLY JACK	2
7	026938	JACK, SP DOLLY	1
8	039633	DECAL, DOLLY JACK SYSTEM	1
9	040637	BOLT, 3/8-16 X 2-1/4 GR 8 HHC	4
10	099014	ASSY, 410/350 X 4 PNEU WHEEL	2

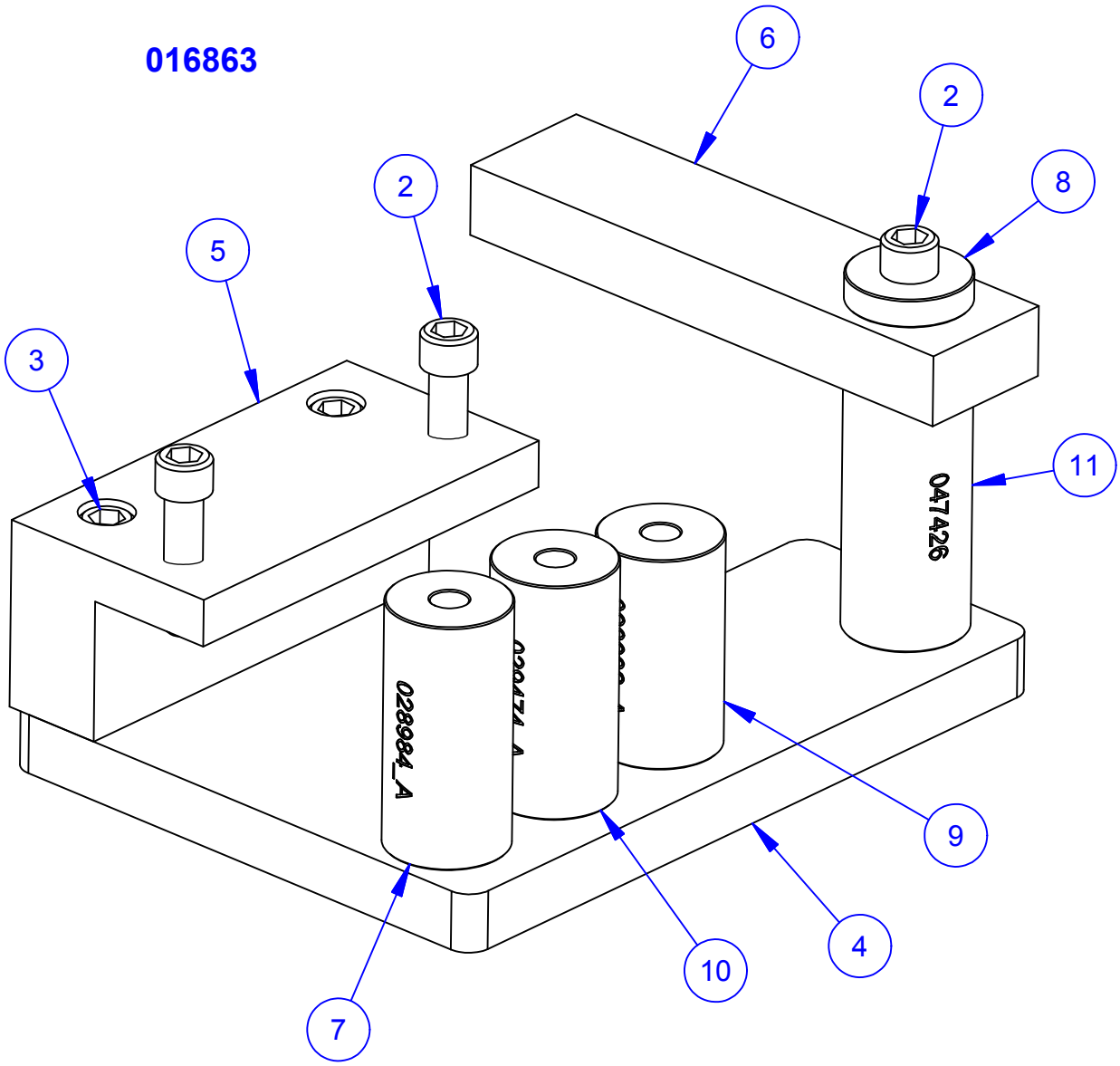
Rear Dolly Jack Assembly Illustration



Rear Dolly Jack Assembly
Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	010133	PIN, 3/16 X 2 COTTER	2
2	010464	FSTN, NUT NYLOK 3/8-16	4
3	015692	CAP, Ø1/4 RED GREASE	2
4	017751	FSTN, FW HARD A325 3/8 (p)	8
5	024628	SPACER, DOLLY JACK	4
6	026728	LIFT, REAR DOLLY JACK	2
7	026938	JACK, SP DOLLY	1
8	039633	DECAL, DOLLY JACK SYSTEM	1
9	040637	BOLT, 3/8-16 X 2-1/4 GR 8 HHC	4
10	099014	ASSY, 410/350 X 4 PNEU WHEEL	2

Trowel Arm Alignment Jig Assembly Illustration

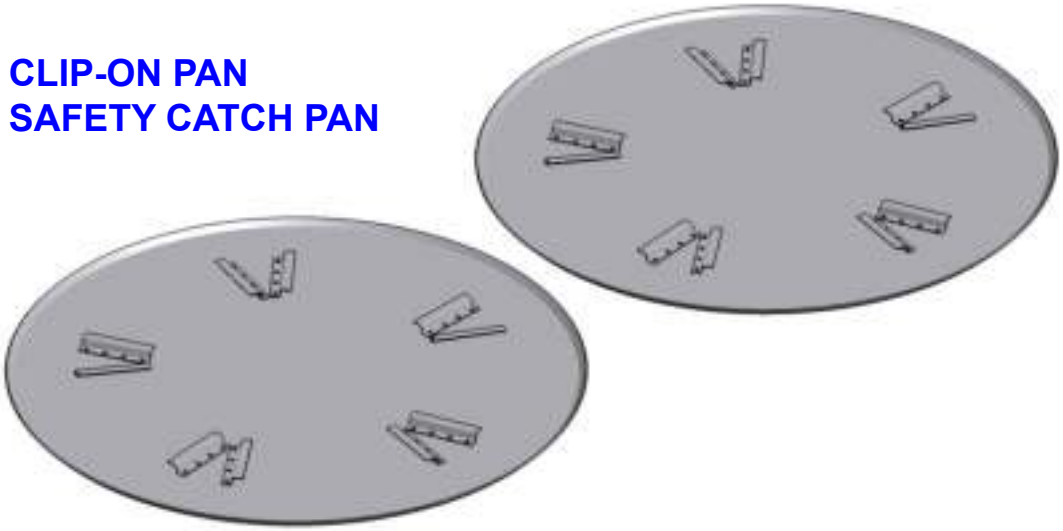


Trowel Arm Alignment Jig Assembly Parts List

ITEM	PART NO.	DESCRIPTION	QTY
1	015884	SCREW, 3/8-16x1 SCKT CAP	4
2	016877	FSTN, SHCS 3/8-16 X 1-1/2	3
3	028076	SCREW, 3/8-16x2 SCKT CAP	2
4	028981	BASE	1
5	028982	CLAMP, BLOCK	1
6	028983	ARM	1
7	028984	SPACER, 2.600 HGT ADJUSTING	1
8	028985	WASHER	1
9	028986	SPACER, 2.243 HGT ADJUSTING	1
10	029474	SPACER, 2.500 HGT ADJUSTING	1
11	047426	SPACER, 2.725 HGT ADJUSTING	1

Accessories

051552 - CLIP-ON PAN
051553 - SAFETY CATCH PAN



042779 - LIFT BRIDLE, 2500# 6’ SLING

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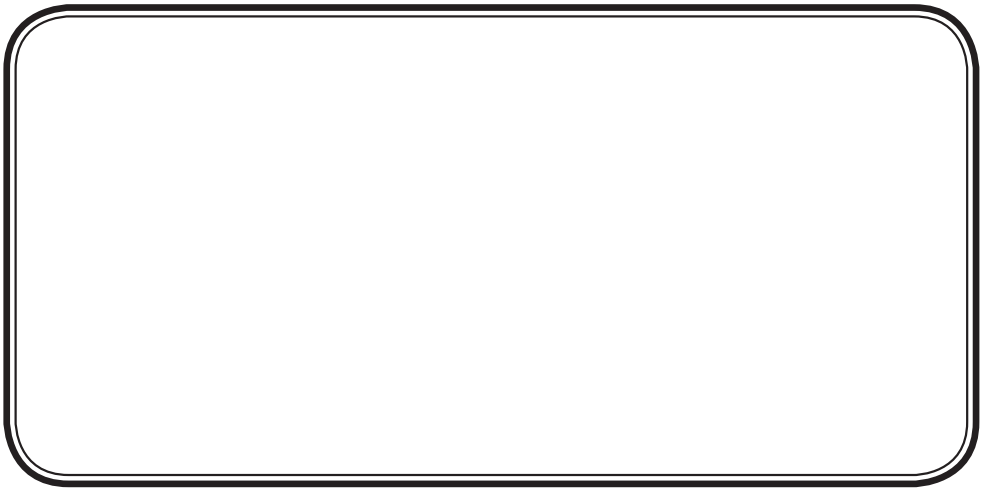

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