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B70 Straw Blower

Operator Instructions and Parts Manual

Model MN Serial No. _____

[illegible][illegible]



ACTIVATE YOUR FINN EQUIPMENT WARRANTY

IMPORTANT INFORMATION ON ACTIVATING YOUR FINN EQUIPMENT WARRANTY!!!

IT IS **IMPERATIVE** THAT YOU, THE PURCHASER, COMPLETE THE FOLLOWING STEP IN ORDER TO ACTIVATE THE FINN CORPORATION LIMITED WARRANTY.



COMPLETE THE **EQUIPMENT REGISTRATION** FORM
AND MAIL TO THE FINN CORPORATION.

IF FINN CORPORATION DOES NOT HAVE YOUR COMPLETED REGISTRATION
FORM ON FILE, YOUR WARRANTY CLAIM WILL BE DENIED.

Once your FINN equipment has been registered, your FINN Limited Warranty will
be activated per the warranty statement on the next page.

<< What should you do if you need repairs or parts under Warranty? >>



1. NOTIFY FINN CORPORATION OF THE FAILURE OF MATERIAL OR WORKMANSHIP
1-800-543-7166 Extension (246)
WARRANTY@FINNCORP.COM



2. AFTER YOU OR YOUR SERVICE DEALER NOTIFY FINN, FINN WILL:
 - VERIFY THAT WE HAVE YOUR REGISTRATION ON FILE
 - VERIFY THAT THE WARRANTY PERIOD IS IN EFFECT
 - VERIFY THAT THE RELATED PART(S) ARE INCLUDED IN THE SCOPE OF WARRANTY (PENDING FINN'S INSPECTION OF DEFECTIVE PARTS)
 - SEND YOU REPLACEMENT PART(S) AND A WARRANTY INFORMATION PACKET
 - REQUEST YOU FOLLOW ALL INSTRUCTIONS AS NOTED IN THE PACKET
 - **Completely fill out the Parts Tag.**
 - **Attach the Parts Tag to the defective part(s).**
 - **Return the part(s) and the completed Warranty Claim Form to FINN Corporation using the return shipping label (Within 2 weeks).**
 - **Tape the Orange identifier sheet, marked with the W/RMA number, on the outside of the box in which you are shipping the defective part(s).**



WARRANTY PERIOD

Hydroseeders® and Straw Blowers: 2 years or 2000 hours whichever comes first.

All other equipment: 1 year or 1200 hours whichever comes first.

COMMERCIAL LIMITED WARRANTY
EFFECTIVE 04/01/2011

OUR WARRANTY TO YOU

Finn Corporation warrants to you, the original purchaser, for use (or rental to others for use) all new construction machinery, parts and attachments (except those referred to herein) that are manufactured by Finn to be free from defects in material and workmanship for a period noted above. Replacement parts provided under the terms of this warranty are warranted for the remainder of the warranty period applicable to the product to which parts are installed, as if parts were original components of the product.

WHAT FINN WILL DO

Upon notification of Finn concerning a failure of material or workmanship in accordance with the above stated Warranty, Finn Corporation will:

- Verify claim falls within the valid warranty time frame.
- Verify the product and equipment has been **registered** with Finn in order to be eligible for warranty coverage.
- Upon affirmation of warranty period and registration, Finn will send to you a new or repaired replacement part(s), whichever Finn elects and a "Warranty Claim Information packet" containing instructions for processing the warranty claim.
- Evaluate the part when defective part is returned. Note: Failure to return defective part within **two weeks** will result in an invoice being sent to the customer. In addition, if damage to a part is determined not to be covered under the warranty, the customer will be billed.
- Reconcile costs with customer for parts and shipping, as determined by our inspection of failed parts, and confirmation of warranty coverage, per the terms of this warranty.
- Correction of nonconformities, in the manner provided above, shall constitute fulfillment of all liabilities of Finn Corporation.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

- As the purchaser covered under the above limited warranty you must **REGISTER** the equipment with Finn **FAILURE TO REGISTER WILL VOID THE WARRANTY**.
- Claim Number: Notify the Warranty Department same day or next day of any intent to do warranty work and obtain a "Warranty Claim Number."
- All warranty labor must be pre-approved by providing Finn with an estimate of labor costs. Once approved, Finn will issue you a Work Authorization Number, prior to work being performed. (EXCEPTION: Unless the labor is per the Labor Allowance Schedule or less.)
- The labor costs reimbursement will be based on the Labor Allowance Schedule established by Finn and where not applicable, on a reasonable number of hours as determined by Finn.
- Notify Finn Corporation of any failure of material or workmanship as described under this warranty.
 - Web notification: Warranty@Finncorp.com
 - Phone 1-800-543-7166 extension 246
- Complete the required steps in the "Warranty Claim Information packet" (which Finn will send you) and return the defective part(s) as directed in the packet to Finn Corporation.
- Should the failed part, be a hydraulic component, Finn may send you an "**Oil Analysis Kit**," requesting that a sample of oil from the hydraulic system be taken, and mail it to a lab. Follow the instruction sheet, on how to use your Finn Oil Analysis Kit that comes with the Kit. Failure to comply when requested will void the warranty.

WHAT THE WARRANTY DOES NOT COVER

1. Normal wear parts and Allied Equipment or trade accessories not manufactured by it, such as but not limited to items such as various filters, fluids, brakes, clutch linings, belts, hoses, light bulbs, mechanical seal, over center clutches, tires, ignitions, starters, batteries, magnetos, carburetors, engines and labor, or like or unlike equipment or accessories. (Such being subject to the warranty, if any, provided by their respective manufacture).
2. Secondhand, used, altered, or rebuilt machines or parts.
3. Defects, malfunctions or failures resulting from accidents, abuse, misuse, improper servicing, or neglect of required operational guidelines and maintenance service, as outlined in the Finn Corporation's Operators Manual(s).

4. The warranty shall be null and void to the extent any defect or failure of the products warranted arises out of or is caused by accessories or component parts not manufactured or supplied by Finn Corporation, whether same are supplied by purchaser, dealers, or any other party.
5. This Warranty does NOT cover any costs associated with transporting the equipment for warranty service, such as mileage, fuel, or man hours; such is the responsibility of the equipment owner.
6. Dealers and Customers are responsible to follow all guidelines related to Seasonal and Long Term Storage of Equipment, as advised in operation and equipment manuals (i.e. Finn, Engine, Clutch, Pump, Motor, etc). Equipment failures caused by neglect of these guidelines are NOT warrantable.

THIS IS THE ONLY EXPRESS WARRANTY ON OUR PRODUCTS

We neither assume nor authorize anyone to assume for us any other express warranty. The Distributor/Dealer has no authority to make any representation or promise on behalf of Finn Corporation or to modify the terms or limitations of this warranty in any way.

THIS WARRANTY THEREFORE SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATIONS ON OUR RESPONSIBILITY WITH RESPECT TO PRODUCTS PURCHASED

THE REMEDIES OF THE USER SET FORTH HEREIN ARE EXCLUSIVE, WITHOUT REGARD TO WHETHER ANY DEFECT WAS DISCOVERABLE OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT TO THE PURCHASER.

ALL WARRANTY REPAIR MUST BE DONE BY A FINN AUTHORIZED SERVICE PROVIDER OR AUTHORIZED REPAIR SHOP OF FINN'S CHOICE.

TRANSPORTATION, HAULING, STORAGE, OR OTHER SIMILAR COSTS ARE NOT PART OF FINN'S OBLIGATION UNDER THE LIMITED WARRANTIES AND IS THE RESPONSIBILITY OF THE EQUIPMENT OWNER.

THE ESSENTIAL PURPOSE of this exclusive remedy shall be to provide the original purchaser with repair or replacement of parts that prove to be defective within the period and under the conditions previously set forth. This exclusive remedy shall not have failed of its essential purpose (as that term is used in the Uniform Commercial Code) provided Finn remains willing to repair or replace defective parts within a commercially reasonable time after it obtains actual knowledge of the existence of a particular defect.

IN NO EVENT shall Finn be liable for any special, consequential, incidental or indirect damages, including lost profits or lost commercial opportunities, with respect to the sale of the above warranted product or anything done in connection therewith, or for property damage sustained by a person claiming to be a third party beneficiary of a surviving warranty under the law of any jurisdiction.

NOTICE

FINN CORPORATION URGES the use of only Finn corporation supplied parts and attachments to assure proper performance and safe operation of Finn corporation equipment. Insist on parts and attachments manufactured or supplied by Finn corporation when you purchase, repair or replace your Finn equipment and attachments. Because Finn corporation cannot assure that parts and attachments not manufactured or supplied by Finn meet Finn corporation's quality standards, specifications, or operating requirements, our warranty is not effective to the extent any failure of or defect in a Finn corporation product arises from or is caused by parts, attachments or components not originating with Finn corporation. Use of Finn corporation equipment with parts and attachments not manufactured or supplied by Finn could result in personal injury.

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SAFETY FIRST

With any piece of equipment, new or used, the most important part of its operation is **SAFETY!**

FINN Corporation encourages you and your employees to familiarize yourselves with your new equipment and stresses safe operation.

The first five pages of this manual are a summary of the main safety aspects associated with this unit. Be sure to read and understand completely before operating the machine.

The symbols below are used throughout the operation and maintenance sections of this manual to call attention to safety procedures.



Danger indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.



Warning indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.



Caution indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.



Notice indicates important information, that if not followed, MAY cause damage to equipment.

NOTE: This is helpful information.

CALIFORNIA PROPOSITION 65



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



Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

STRAW BLOWER SAFETY SUMMARY SECTION

It is important that all operators of this machine are familiar with all safety aspects mentioned below, and have read the entire Operator's Manual before operating the machine. Always keep a copy of this manual with the machine. It is the responsibility of the operator of the machine to fully understand this safety sheet. Remember that **YOU** are the key to safety. Good safety practices protect not only you, but also the people working with and around you. Keep in mind that this safety sheet is written for this type of machine only. Practice all other usual and customary safe working precautions. Above all, remember that safety is up to you.



The FINN STRAW BLOWER is intended to be used as an applicator of vegetative hay or straw mulches onto the seedbed. Its use with other products or for other applications must be by approval of the product's manufacturer. If there are any questions, contact Finn Corporation at 1-800-543-7166.

I. PRE-START EQUIPMENT CHECK

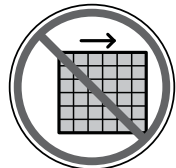
(equipment check is to be made with the engine off)

1. Check hitch and hitch bolts, safety chains, lights, brakes, and breakaway switch. Verify that the hitch ball is the correct size for the coupler.
2. Check that all guard railing is in place and secure.
3. Verify that all guards are in place.
4. By carefully looking in the shredder box, inspect the shredder box for foreign objects.
5. With the ignition switch ON, verify that the signal horn is operating correctly.
6. Make sure no one is working on or inside the machine. Give a visual and audible signal that all is clear before starting the engine.



II. MACHINE OPERATION

1. Always wear safety goggles when operating or feeding the machine. Other safety attire, such as safety shoes, ear protection, gloves, hard hats, dust masks, etc., should be worn as required by warning decals on machine, operator's manuals, or job site requirements. Remove rings, watches, etc. Avoid wearing loose-fitting clothing that may get caught in rotating machinery.
2. Do not operate the machine without all guards in place.
3. Make sure the discharge spray area is clear of all persons, animals, etc.
4. The driver of the carrying or towing vehicle is responsible for the safety of the operator(s) and feeder(s) of the machine. Make sure the driver is aware of and avoids all possible hazards to the operator(s) on the machine, such as tree limbs, low power lines, etc. Vehicles on which equipment is mounted or towed must be started or stopped gradually. Avoid abrupt starts and stops. Never operate on a slope or a hill that may endanger the operator(s). All personnel should review and be familiar with start/stop signals between the driver and operator(s) before operation of the equipment.
5. Operator(s) of equipment should never ride on machine at speeds greater than 5 MPH (8 km/h).



6. Never operate machine in an enclosed area without venting the exhaust of both the equipment and the vehicle on which the equipment is mounted or towed. Deadly carbon monoxide fumes can accumulate.



7. Never operate this or any other machinery when fatigued, tired, under the influence of alcohol, illegal drugs, or medication. You must be in good physical condition and mentally alert to operate this machine.

8. Never modify the machine. Never remove any part of the machine (except for service and then reinstall before operating).



9. Use proper means for mounting and dismounting of machine. Never mount or dismount a moving machine.
10. Do not aim discharge at people, animals, etc. Only aim the discharge at the intended seedbed.
11. Do not open any doors or access panels while machine is in operation. Severe injury may result from rotating parts.

12. Do not attempt to pull anything out of the feed chute or shredder box when machine is in operation. Shut down the engine using Occupational Safety and Health Administration Occupational Safety and Health Administration (OSHA) lockout/tagout procedure (29CFR 1910.147) before removing any foreign objects. Give a visual and audible signal that all is clear before restarting the machine.



III. MAINTENANCE

1. Before servicing the machine, turn off engine and allow all moving parts to stop. Disconnect the battery cables to prevent accidental starting of the machine. Tag the engine operating area to show that the machine is being serviced. Use lockout/tagout procedure (29 CFR 1910.147).



2. On trailer units, perform general maintenance such as checking the safety chains, hitch, hitch bolts, tires, and brakes. Repair or replace if worn or broken. Never operate machine on improperly inflated or damaged tires. Always use a safety cage or cable restraints when reinflating a repaired tire.




3. Battery maintenance. Lead-acid batteries contain sulfuric acid, that will damage eyes or skin on contact. Always wear a face shield to avoid getting acid in the eyes. If acid contacts eyes, flush immediately with clean water and get medical attention. Wear rubber gloves and protective clothing to keep acid off skin. Lead-acid batteries produce flammable and explosive gases. Keep arcs, sparks, flames, and lighted tobacco away.
4. Filling of fuel. Never fill the fuel tank while the engine is running, while smoking, or when near an open flame. Never smoke while handling fuel or working on the fuel system. The fumes in an empty fuel container are explosive. Never cut or weld on fuel lines, tanks, or containers. Move at least 10 feet (3 meters) away from fueling point before starting engine. Wipe off any spilled fuel and let dry before starting engine.



IMPORTANT: Be careful not to allow fuel, lubricant, hydraulic fluid, or cooling fluids to penetrate into the ground or be discharged into the water system. Collect all used fluids and dispose of them properly.

5. It is recommended that only authorized, genuine FiNN replacement parts be used on the machine.
6. Make certain that all decals on the machine are maintained in good legible condition. Replacement decals are available through FiNN Corporation by specifying the part number shown in the lower right-hand corner of the decal. See page 4 for the current set of safety decals mounted on the unit. See Parts Manual for the location and quantity of all decals on this unit.

CURRENT SET OF SAFETY DECALS




⚠ WARNING

RUNAWAY VEHICLE HAZARD!
Always inspect tow vehicle and equipment hitch before towing.
Tighten all hitch bolts and properly connect wiring and safety chains.

BREAKAWAY SWITCH
DO NOT use for parking.
Attach cable to towing vehicle with enough slack for turning.
Engine battery on trailer must be charged and hooked-up for proper breakaway function.

SAFETY CHAIN INSTALLATION
Both the single and double chains must be crossed under tongue. They must be oriented in such a manner as to prevent tongue from dropping in event of failure to hitch, coupler or ball. Chains must be connected to towing vehicle so slack for each length of chain, between trailer and towing vehicle, is the same and must have no more slack when in use than necessary to permit proper turning of vehicles. Forward end of chain must be attached to towing vehicle, not to ball, but to hitch or other frame member. Chain must be looped around member and hooked back into itself.
Failure to comply could result in death or serious injury.

P/N 31451




⚠ CAUTION

Wear ear protection when operating machine.

The sound power level could exceed 80 dB(A) while the unit is in operation.

Failure to comply could result in moderate or minor injury.

P/N 13184




⚠ WARNING

BURN HAZARD!
Cooling system is under pressure.
Allow system to cool before handling.
Remove radiator cap slowly.
Wear appropriate safety gear.
Failure to comply could result in death or serious injury.

RADIATOR HANDLING INSTRUCTIONS

1. Use a 50/50 solution of water and antifreeze. Using 100% antifreeze will result in engine damage.
2. Check and replenish water prior to use. More water will be consumed when operating in hot conditions.
3. If overflow pipe begins emitting vapor, check and replenish water.
4. Remove and clean screen when dirty.
5. Check and clean fins periodically. Clogged fins will increase water consumption.
6. Protect radiator from fertilizer corrosion by washing radiator core with water.


P/N 31452



CAUTION

NEW CLUTCH INFORMATION
A new clutch may require several adjustments until friction surfaces are worn in.
DO NOT let clutch slip. This will glaze and ruin friction surfaces.
When properly adjusted a heavy pressure is required at lever to move throwout linkage to "over center" or locked position.
Always maintain proper adjustment.
Consult operations manual for adjustment instructions.
Failure to comply may result in equipment damage.

P/N 31257




⚠ WARNING

SEVERE HAZARD!
Keep hands clear!
Rotating fan and gears.
DO NOT operate without guards or doors in place.
Shut off engine, disconnect battery, and allow all moving parts to stop before servicing.

FLYING DEBRIS!
Wear eye protection around equipment.
Failure to comply could result in death or serious injury.

P/N 31453






⚠ WARNING

BURN HAZARD!
Hot exhaust!
Stay back!
Failure to comply could result in death or serious injury.

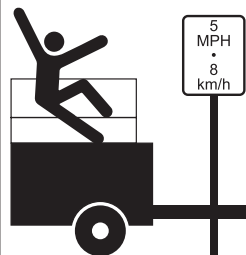
P/N 12278



⚠ DANGER

Rotating Parts.
Turn off engine and allow all parts to stop completely before opening door, removing guards or attempting service.

20988



⚠ CAUTION

Personnel should not ride this equipment at speeds greater than 5 MPH (8 km/h).

20970

⚠ CAUTION



Wear proper eye protection when feeding this machine.

22690

Operation and Maintenance Manual for B70 Straw Blower

INTRODUCTION

This manual is designed for step-by-step instructions of the operation, care, and maintenance of the B70 Straw Blower and, in addition, it contains illustrations and descriptions of a complete list of parts and components for easy identification. For best results and to ensure longer life of the equipment, please follow the instructions carefully. For your safety, read the entire manual before operation of this unit.

DEFINITION OF MULCHING

Mulching is the process whereby a vegetative mulch, such as hay or straw, sometimes excelsior, or other wood product or other vegetative material, is spread on previously seeded areas to promote germination, while providing temporary erosion control.

THE FINN B70 STRAW BLOWER AND HOW IT WORKS

The FINN B70 Straw Blower will apply vegetative mulch at a fast and uniform rate, utilizing a minimum amount of manpower.

The baled vegetative mulch material is placed on the feed chute and separated by the bale feeder as he or she feeds these bales into the shredder housing. In the shredder housing, a combination of beater chains and air currents separates the mulch into individual fibers that are drawn into the blower housing and blown through the discharge assembly onto the seedbed.

TOWING VEHICLE

The truck used to tow the FINN B70 Straw Blower should have a bed large enough to carry the quantity of mulch needed for economical operation. The truck must be equipped with a ball or pintle type hitch to tow the Straw Blower. This hitch should be mounted as near to the end of the truck bed as possible. Use a 2 inch ball, rated 6000 lb. (2721 kg): the tow vehicle must be able to support 600 lb. (272 kg) down on its hitch.

LOADING BALES

Load the bales of mulch on the truck bed with binder twine or wire on top rather than on the side. This makes it easier to grab the bales while the Straw Blower is in operation. Place the first layer of bales "lengthwise" on the truck. The second layer of bales should be placed "crosswise". Alternate successive layers lengthwise and crosswise in order to secure the load. Leave enough room at the rear of the truck bed for the bale handler to stand.

PRE-START CHECK

1. Skid Unit – Check condition of all mounting hardware securing the Straw Blower to the truck bed.
Trailer Unit – Inspect hitch, safety chains, lights, brakes, and breakaway switch.
2. Ensure all guards are in place.

EQUIPMENT CHECK

⚠ WARNING

Equipment check should be made with the engine OFF and all rotating parts stopped. Failure to comply could result in death or serious injury.

1. Tool kit - make sure that it contains all prescribed items (see tool kit list).
2. Check beater box for foreign objects that could damage the equipment or injure workers.
3. Check fuel tank and fill as required. Refer to engine operator's manual for fuel specifications and requirements.
4. Check engine oil and fill or change as required. Refer to engine operator's manual.
5. Check liquid level in radiator and overflow tank. Refer to engine operator's manual.
6. Inspect air cleaner for dust and dirt. Refer to engine operator's manual.
7. Engage and disengage clutch to determine if it "snaps" in and out of engagement.
8. Check beater chains and their mounting pins for damage or wear. Replace if necessary.
9. Lubricate equipment. Use hand gun only (see lube chart).

STARTING PROCEDURE

⚠ CAUTION

See safety section of the manual (pages 1 through 4) before operating the machine. Failure to comply could result in minor to moderate personal injury. Failure to comply could also result in product or property damage.

1. Make sure the fuel filter/water separator fuel cock is in the ON position.
2. Disengage the PTO (if equipped).

NOTICE

Never use an engine starting aid such as ether. Engine damage will result. Be sure to perform priming the engine before starting. If air is mixed to the fuel, seizure to the supply pump and the injector may result.

3. Insert the key into the key switch. The control panel is powered from the engine battery connection from the engine harness connector. Make sure the engine harness is connected to the control panel before proceeding.
4. Power up the system by turning the key switch to the **ON** "①" position. This will activate the control panel and apply power to the engine ECU. The system automatically energizes the glow plug relay and keeps it energized for a particular amount of time depending on the cooling water temperature.

NOTE: The glow plugs are used to assist starting in cold weather conditions.



⚠ WARNING

If the control panel indicates a fault condition, DO NOT start the engine. Review the fault condition and correct the condition before starting the engine. See Fault Codes section for details on system faults.

5. Turn the key clockwise to the **START** “🔑” position. Release the key as soon as the engine starts. It will return to the ON position. If a fault condition exists, the engine ECU may prevent the engine from starting. All fault conditions will be indicated by the digital display. The display will indicate the active fault(s) by presenting a pop-up graphic describing the fault condition.

NOTICE

Never hold the key in the START position for longer than 15 seconds or the starter motor will overheat.

6. If the engine fails to start:
 - a. Wait until the engine comes to a complete stop before you attempt to start it again. Engaging the starter while the engine is still rotating will result in damage to the starter and flywheel.
 - b. Wait at least 30 seconds before you attempt to start the engine again. This procedure will allow the battery voltage to recover and prevent damage to the starter motor due to a low battery voltage.
7. Once the engine is started, the control panel will set the engine speed to the minimum RPM speed setting. To change the engine speed, toggle the throttle control switch (“Fast-Rabbit/Slow-Turtle”) to the desired speed setting. The engine speed cannot be set below the minimum RPM speed setting or above the maximum RPM speed setting.
8. With the engine still idling, engage the clutch slowly. Move the throttle to wide-open position and let the governor control the engine speed.



SHUTTING DOWN THE ENGINE

For maximum engine life, allow the engine to idle, without load, for five minutes. This will allow the engine components that operate at high temperatures, such as the turbocharger (if equipped) and exhaust system, to cool slightly before the engine itself is shut down.

Follow these steps to shut down the engine:

1. Disengage the PTO.
2. Set the engine speed control to its lowest setting.
3. Run the engine at low idle speed for at least five minutes before you shut it down.
4. Turn the key to the **OFF** “|” position, and remove the key from the switch.

CREW MEMBERS AND THEIR DUTIES

1. The Operator controls the placement of the mulch on the seedbed by moving the discharge assembly. He also controls the movement of the towing truck along the seedbed by using a predetermined set of hand or horn signals.
2. The Bale Handler operates from the truck bed and supplies the feeder with bales of mulch material, cut side up.
3. The Bale Feeder cuts and disposes of the twine or wire. He also separates the bale into 1-1/2 to 2 in (35 to 50 mm) bats and feeds those into the shredder box allowing about 10 inches of space between bats. Uniform feeding assures fast separation and more uniform application.
4. The Truck Driver follows the directions of the operator for the movement of the towing truck. The truck driver should be cautious in starting or stopping the truck so that the crew members are not thrown off balance.

BLOWER DISCHARGE

The B70 Straw Blower should be towed to a point approximately 20 ft. (6 m) from the area where the mulch is to be applied. The operator should elevate the discharge spout to about 10 degrees above the plane of the seedbed so that the mulch floats onto the seedbed.

NOTE: Do not drive the mulch into the seedbed with air pressure. The higher the tube is held, the more uniform the application will be.

A full circle horizontal travel of the discharge spout allows the operator to vary the direction of the discharge spout according to the prevailing winds. The tube should never be directed into the wind, towards any persons, or at the towing vehicle. Use the engine throttle to control the distance of the mulch.

Except for the side feed model, the shredder box cover has two positions. The lower position directs material more quickly to the blower blade and provides higher capacity with bright straw. The upper position is better for most hay materials since it retains the material in the shredder box longer, resulting in a more even distribution. The unit is shipped with the cover in the lower position.

The B70 Straw Blower has a beater roll on the extended blower shaft. Mounted on this beater roll are four beater chains, installed opposite of each other. This arrangement will work well for most materials. If a longer discharged fiber length is desired, remove two opposing chains.

⚠ CAUTION *Be sure beater chains are mounted opposite each other at all times to avoid throwing the blower shaft out of balance. Failure to comply could result in minor to moderate personal injury. Failure to comply could also result in product or property damage.*

If any obstruction stops the flow of mulch, immediately disengage clutch and shut off engine. Do not reach into the beater box or attempt to make any adjustment until the engine and all rotating parts have stopped. When the obstruction has been removed, the motor can be restarted and mulch application can continue.


⚠ CAUTION *Do not reach into the beater box or attempt to make any adjustment until the engine and all rotating parts have stopped. Failure to comply WILL result in death or serious injury.*

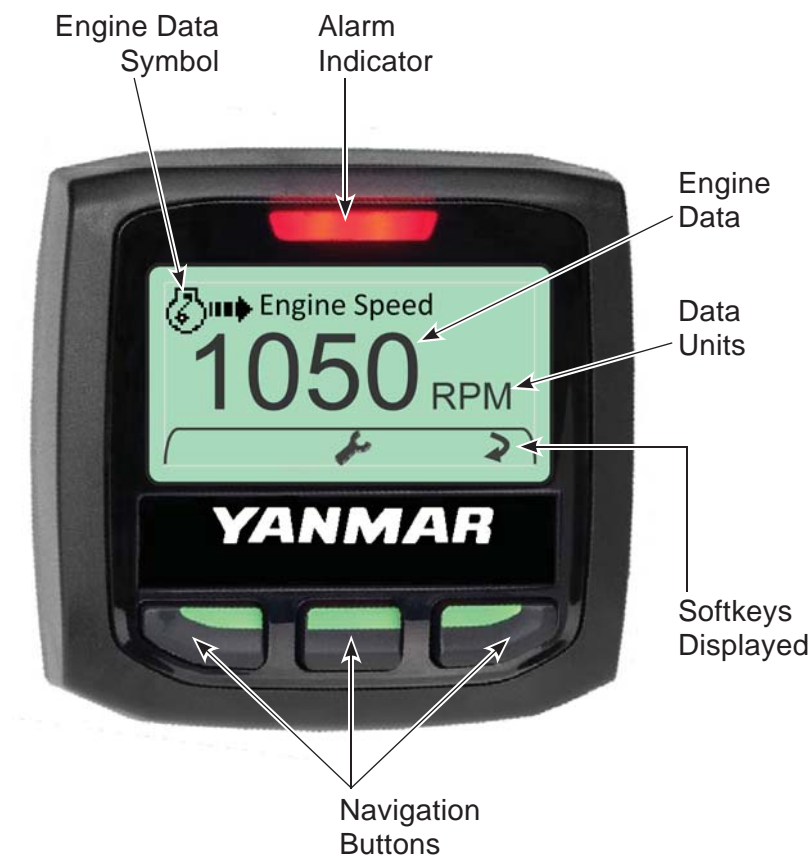
SYSTEM OPERATION

MENU NAVIGATION


The control unit has three navigation buttons which are configured as softkeys. The system softkeys are used to navigate between displays, select menu items and change data. Pressing any of the three navigation buttons will display the softkey menu that is associated with each button.

Softkeys Displayed

-  : Main Menu
-  : Exit
-  : Change
-  : Scroll Up
-  : Scroll Down
-  : Next
-  : Increase Value
-  : Decrease Value
-  : Acknowledge
-  : More Information



CHANGING DATA DISPLAYS

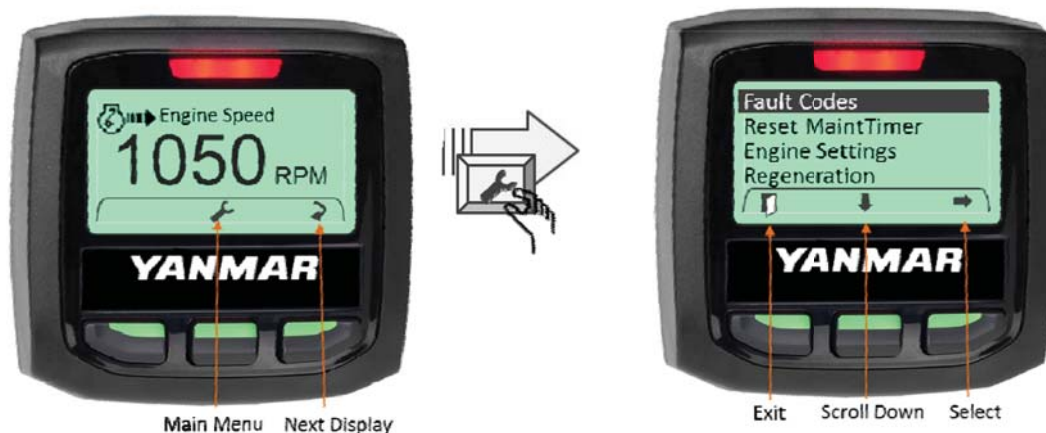
To change the data being displayed, press any key to activate the softkey menu. Press the Change “” softkey to access the next data display available.

See System Display List for complete selection of data displays available.



MAIN MENU ACCESS

To access the Main Menu, press any of the three navigation buttons. The unit will display a softkey popup window defining the available navigation possibilities. Select the Main Menu using the center softkey as shown.



MAIN MENU NAVIGATION

Access the main menu using the center softkey. The main menu will be displayed along with the main menu softkey popup window. Navigate through the main menu selections by using the “↓” key. When the desired menu item is highlighted, press the “→” key to select the menu item. To exit the main menu and return to the data displays press the EXIT “⏏” softkey.



CHANGING PARAMETER SETTINGS

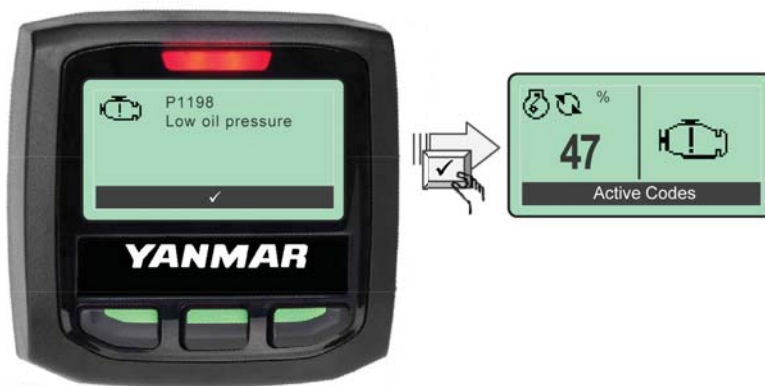
Parameter settings can be changed in one of two ways: using the “+” / “-” softkeys to increase or decrease a numeric value or using the Change “↔” softkey to toggle through a list of programmed settings.

FAULT CODES

Engine fault codes (active and stored) are generated by the engine ECU and communicated to the control panel.

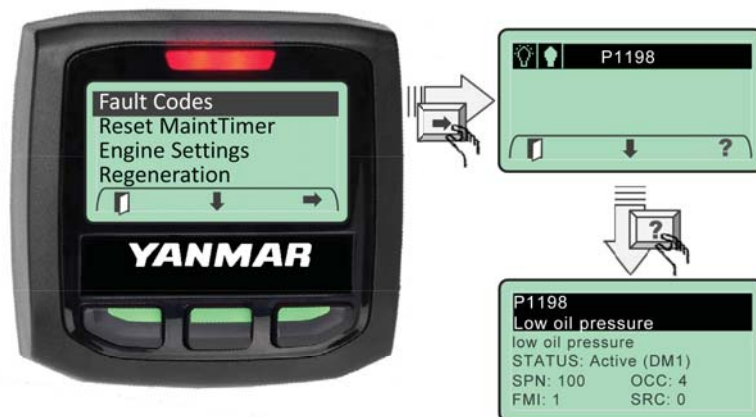
ACTIVE FAULT CODES

The control system reads standard messages to indicate active fault codes. When a fault is active the control system activates a popup fault display containing a check engine icon, fault code number (if applicable), a description of the active fault and an “Active Codes” alarm stripe at the bottom of the display. The control system will activate the red LED fault indicator above the digital display.



When an active fault is presented, the user must acknowledge the fault by pressing the softkey indicated. See “Acknowledging Active Faults” section.

After acknowledging a fault condition, the system will return to normal display operation. The controller will indicate that an active fault is present by displaying a “Check Engine” icon on the main data display. The system will also display an “Active Codes” alarm stripe at the bottom of the display.



ACKNOWLEDGING ACTIVE FAULTS

When the control system receives a new fault, the digital display responds by overlaying a fault pop-up graphic onto the currently active runtime display. This alerts the operator, signaling a response is needed by the operator. The display above (top) represents an unacknowledged fault for an oil pressure fault condition. To acknowledge an active fault, press the “Acknowledge” softkey (middle) button. This will remove the pop-up graphic. The control system will continue to inform the operator that a fault is active or until the fault is corrected.

Note: If the fault condition is cleared the associated pop-up will be automatically removed.

STORED FAULT CODES

The control unit allows the operator to request any stored fault codes that may be contained in the engine ECU. To view stored faults select the “Fault Codes” menu selection from the main menu. The control system will send a request to the engine ECU for any faults that the ECU may have stored. Should any faults exist, the control unit will display a list of the active and stored faults. The list will show if the fault is Active, Stored or both. The list will contain the engine manufacturer specific Fault Code (if available) for the fault condition. To view more detailed information about any of the fault conditions listed, navigate to the desired fault condition and select the “?” softkey. A more detailed description of the fault will be presented along with the current Status.

MAINTENANCE TIMER

The control system provides an engine maintenance timer feature. The maintenance timer is a countdown timer and indicates the amount of engine runtime remaining until maintenance is due. The maintenance timer is configurable and resettable by the operator. If the system is powered but the engine is not running maintenance hours will not be accumulated.

Note: Setting the timer to 0 will disable the maintenance timer operation.

The Maintenance Timer is factory-set to 250 hours.

MAINTENANCE TIMER ALERT

When the maintenance timer expires the system will activate an “Engine Maintenance Due” alert popup window. If the maintenance due alert is acknowledged but the timer is not reset the alert popup will re-initiate for each key “ON” cycle.

ACKNOWLEDGING MAINTENANCE TIMER

Acknowledge the maintenance alert by selecting the acknowledge “✓” softkey.



RESETTING MAINTENANCE TIMER

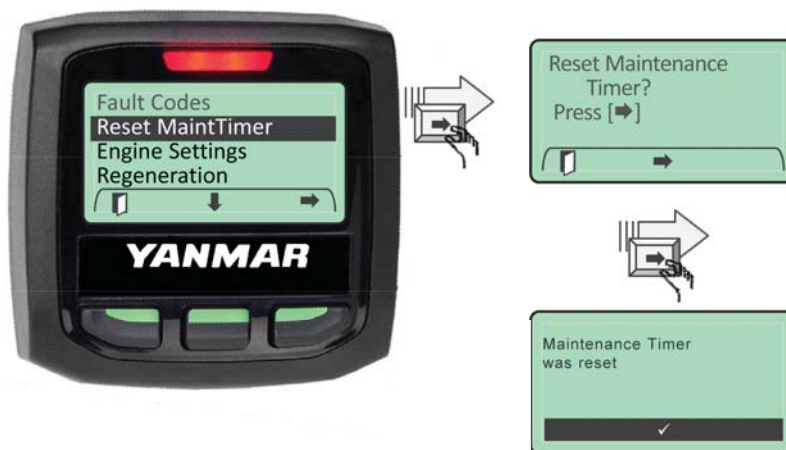
The maintenance timer is operator configurable and can be accessed through the engine settings menu. See “Reset MaintTimer” selection in engine settings menu. When the maintenance timer has expired, a pop-up alert window indicating that “Engine Maintenance is Due” will be displayed. The operator must acknowledge this pop-up to return the control unit to normal display operation.

To reset the maintenance timer enter the Main Menu and then scroll to the “Reset MaintTimer” entry using the “↓” softkey. Press the “→” softkey to select the reset maintenance timer menu item.

Press the “→” softkey to reset the timer.

Acknowledge the timer was reset by pressing the Acknowledge “✓” softkey.

Note: The maintenance hours data display will indicate 0 hrs when the timer has expired and the operator has not yet reset the timer.



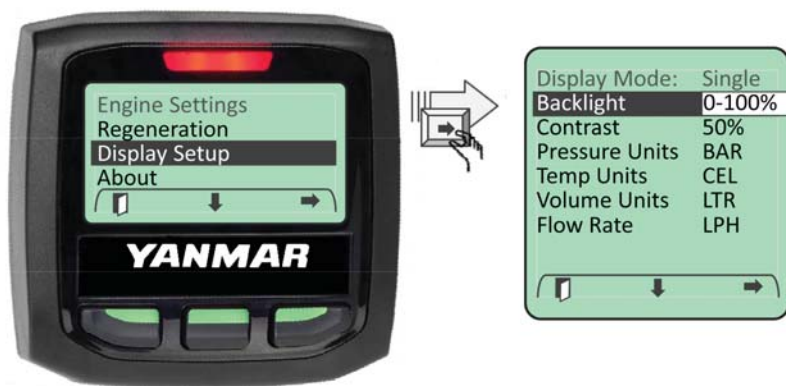
BACKLIGHT SETTING

The LCD backlight is adjustable from 0 to 100%. To adjust the LCD backlight enter the Main Menu and navigate to the “Display Setup” menu using the “↓” softkey.

When highlighted enter the Display Setup menu by selecting the “→” softkey. Navigate through the “Display Setup” menu using “↓” softkey until the “Backlight” entry is highlighted.

Press the “→” softkey to select the backlight parameter setting.

Use the “+” / “-” softkeys to set the backlight value.



CONTRAST SETTING

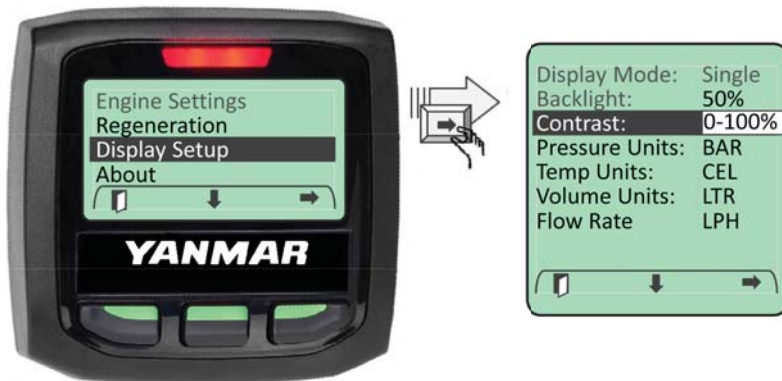
The LCD contrast is adjustable from 0 to 100%. To adjust the LCD contrast enter the Main Menu and navigate to the "Display Setup" menu using the "↓" softkey.

When highlighted enter the Display Setup menu by selecting the "→" softkey. Navigate through the "Display Setup" menu using "↓" softkey until the "Contrast" entry is highlighted.

Press the "→" softkey to select the contrast parameter setting.

Use the "+" / "-" softkeys to set the contrast value.

Note: Setting the contrast value below 30 may render the display to be unreadable.



DISPLAY MODE SETTING

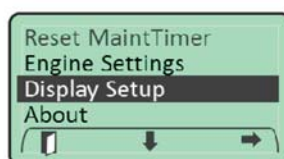
Two display formats are available: “Single” display and “Dual” display formats. To access the display format setting, enter the Main Menu. Navigate to the “Display Setup” menu entry using “↓”

softkey. When highlighted, enter the Display Setup menu by selecting the “→” softkey. Navigate through the “Display Setup” menu using “↓” softkey until the “Display Mode” entry is highlighted.

Choose the desired display mode setting by cycling through the list of choices using the Change “↻” softkey.



Display Mode:	Single
Backlight	Dual
Contrast	50%
Pressure Units	BAR
Temp Units	CEL
Volume Units	LTR
Flow Rate	GPH



Language	English
Display Mode	Single
Backlight	80
Contrast	50



Language	English
Display Mode	Single
Backlight	80
Contrast	50



Language	English
Display Mode	Single
Backlight	80
Contrast	50



Display Mode	Single
Backlight	80
Contrast	50
Pressure Units	PSI



Backlight	80
Contrast	50
Pressure Units	PSI
Temp Units	FAHR



Contrast	50
Pressure Units	PSI
Temp Units	FAHR
Volume Units	GAL



Contrast	50
Pressure Units	PSI
Temp Units	FAHR
Volume Units	GAL

DEFAULT DISPLAY

To configure a particular display as the default startup display, access the desired display and leave active for 5 minutes. The system will automatically set this display as the default startup display.

ENGINEERING UNITS

Displayed engineering units can be configured for Pressure, Temperature and Volume. To access the engineering unit's settings, enter the Main Menu. Navigate to the "Display Setup" menu entry using "↓" softkey.

When highlighted enter the Display Setup menu by selecting the "→" softkey. Navigate through the "Display Setup" menu using "↓" softkey until the desired engineering unit's parameter is highlighted.

Choose the desired parameter setting by cycling through the list of choices using the change soft key.



Display Mode	Single
Backlight	50%
Contrast	50%
Pressure Units	BAR
Temp Units	kPA
Volume Units	PSI
Flow Rate	LPH

Display Mode	Single
Backlight	50%
Contrast	50%
Pressure Units	BAR
Temp Units	CEL
Volume Units	FAHR
Flow Rate	LPH

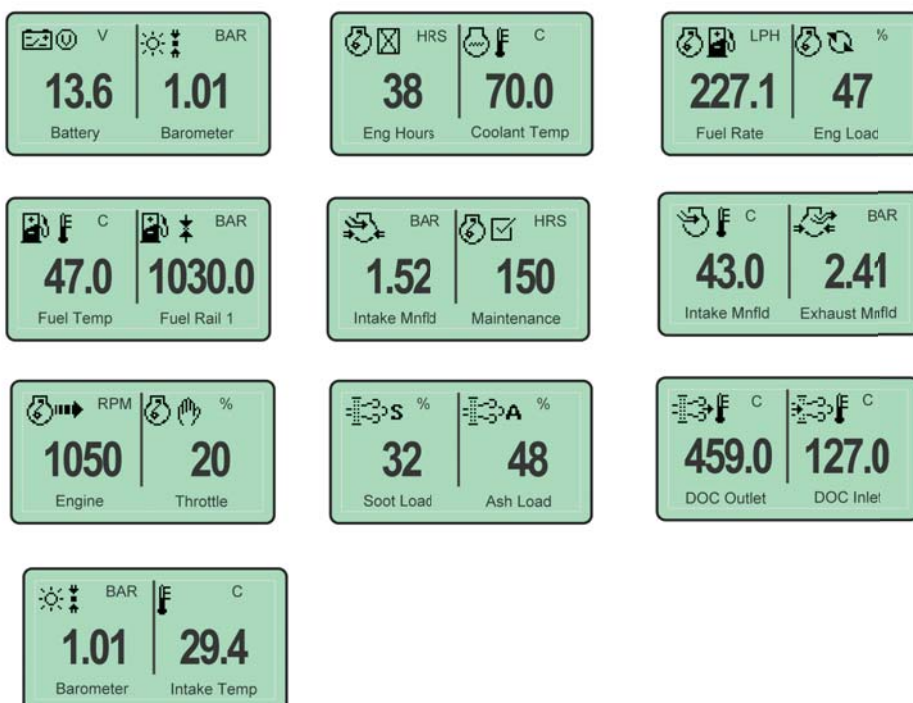
Display Mode	Single
Backlight	50%
Contrast	50%
Distance Units	miles
Pressure Units	psi
Temp Units	F
Volume Units	GAL
Flow Rate	LTR

DISPLAY LIST

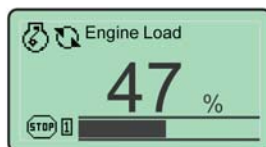
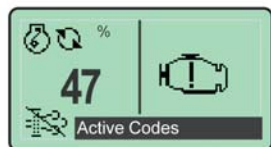
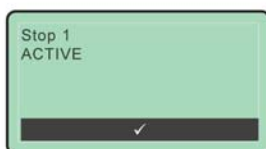
SINGLE DATA FORMAT



DUAL DATA FORMAT



MISCELLANEOUS DISPLAYS



ABOUT MENU

The About Menu indicates the software information used for programming the control unit.

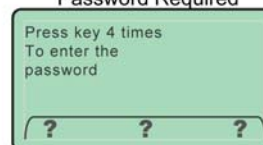


ENGINE SETTINGS

The Engine Settings are factory-specified. This feature is password-protected to ensure the correct use of the engine in this unit.



Password Required



REGENERATION

See Engine Owner's Manual for information on the Diesel Particulate Filter (DPF).

Particulate Matter (PM) in the engine exhaust accumulates in the Soot Filter (SF) within the DPF causing it to clog, reducing engine performance. Therefore, it is necessary to burn off the accumulated PM. This process is referred to as Regeneration. The Engine Control Unit (ECU) uses components such as the DPF differential pressure sensor, temperature sensor, and intake throttle to control assisted DPF regeneration automatically and prevent PM from over-accumulating in the SF. The Yanmar engine uses a stepped approach of both Automatic and Back-up regeneration modes. A detailed description of this process is provided the Engine Owner's Manual, but a brief summary is also provided below.

Automatic Regeneration Modes – These modes are performed automatically by the Engine Control Unit and operate without input from the machine operator or impact to mulching operations.

Self Regeneration (Normal) – Regeneration without the use of assistance devices (e.g. intake throttle). During operation at high speed or high load, the exhaust temperature rises to a sufficient level such that PM is continuously combusted and eliminated.

Assisted Regeneration – Regeneration with the use of assistance devices (e.g. intake throttle). When the differential pressure in the SF inlet/outlet in the DPF rises, the differential pressure sensor installed on the DPF detects the increase. The Engine Control Unit (ECU) commands the intake throttle to adjust the amount of engine intake air to increase exhaust temperature to a sufficient level such that PM is combusted and eliminated.

Reset Regeneration – Regeneration with the combined use of Assisted Regeneration and post-injection. Approximately every 100 hours of operation, the Assisted Regeneration and post-injection are automatically used together to control regeneration by increasing the exhaust temperature to burn off and remove PM.

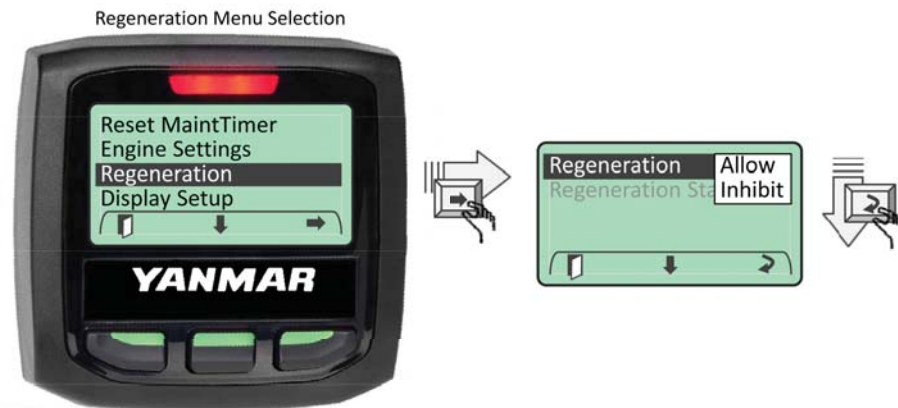
Back-up Regeneration Modes – These modes require direct action from the operator to be performed and the machine cannot be used for mulching operations while Back-up regeneration is underway.

Stationary Regeneration – Although the DPF performs the regeneration control, if the operation conditions with idling at no load and low speed/low load operations are frequently repeated, the PM may not be regenerated. If the ECU determines that performing the Stationary Regeneration is required at this time, the operator will be alerted via the control panel that a Stationary Regeneration is required. A Stationary Regeneration takes approximately 30 minutes to complete.

Recovery Regeneration – Recovery Regeneration occurs when Stationary Regeneration cannot be completed and the engine has gone into Limp Home Mode. The Recovery Regeneration takes approximately 3 hours to complete. If the Recovery Regeneration is unsuccessful, the Soot Filter will need to be serviced by a Yanmar certified service center.

RESET REGENERATION NORMAL OPERATION - DISPLAYS

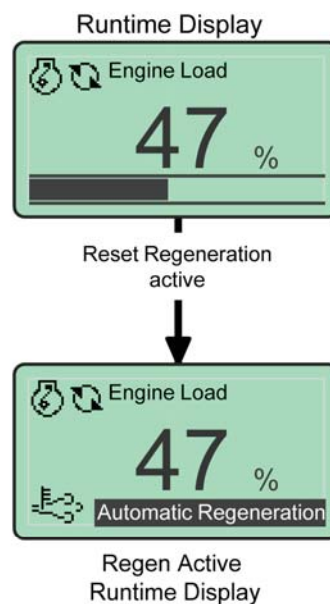
The engine control panel is set at the factory to allow Reset Regeneration to occur automatically. However, the operator has the option to inhibit Reset Regeneration via the control panel
[Main Menu "→"
Regeneration "→" Inhibit]
if the work environment poses a risk to safe regeneration.



During machine operation with Regeneration in the "Allow" state, on the control panel, when the ECU begins Reset Regeneration, a notification and regeneration icon will display at the bottom of the screen.

NOTE: The ECU will not perform Reset Regeneration within the first 50 hours of engine life.

NOTE: The machine can be operated normally during Reset Regeneration. The machine can also be turned **OFF**. If this occurs, Reset Regeneration will resume again when the machine has been turned back **ON** and the DOC temperature has risen to a sufficient level.



CAUTION

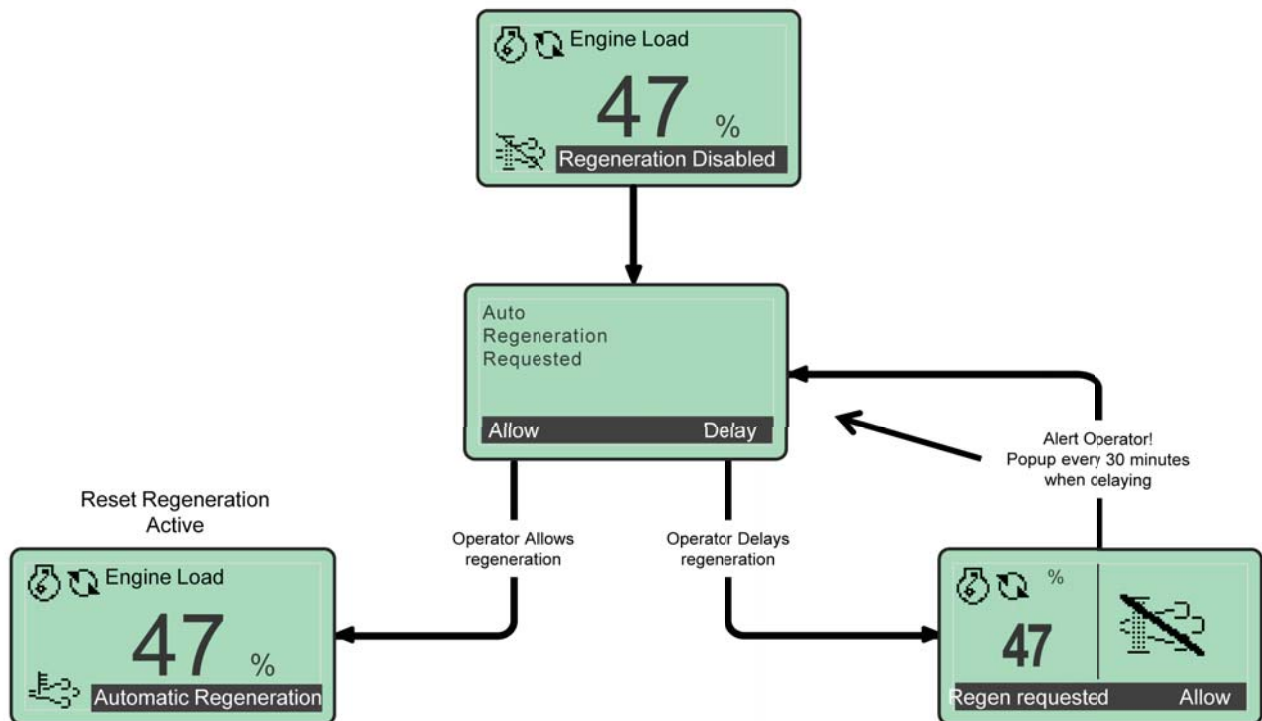
During Reset Regeneration, post-injection is used and fuel is burned directly inside the DPF (burned by chemical reaction inside the Diesel Oxidation Catalyst (DOC). Through this heat, regeneration occurs inside the SF, but the combustion increases the temperature of the exhaust gas to close to 600° C (1112° F). Be careful that neither people nor flammable materials are near the exhaust gas outlet.

NOTE: During Automatic Regenerations, the following conditions may occur due to the characteristics of the DPF system, but they are not malfunctions.

- The engine sound may change during idling operation at no load.
- White smoke may be discharged from the exhaust pipe right after starting a cold engine or during acceleration. This is due to the discharge of water vapor. When the exhaust temperature increases, the white smoke disappears.
- The exhaust gas is purified through the catalyst installed in the DPF, so the smell of the exhaust gas is different from the exhaust gas of a conventional diesel engine.

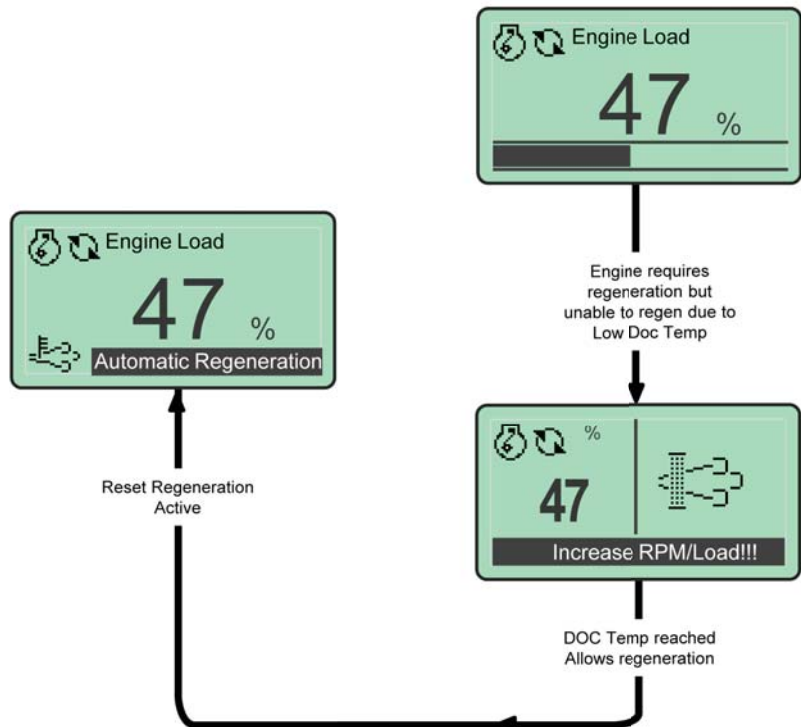
RESET REGENERATION STANDBY DUE TO INHIBIT SWITCH

During machine operation with Regeneration in the *Inhibit* state on the control panel, a notification and regeneration inhibited icon will display at the bottom of the screen. If the ECU determines that Reset Regeneration is required, a Auto Regeneration request will be displayed. If the operator allows the regeneration, it will begin and a notification and regeneration icon will display at the bottom of the screen. If the operator delays the regeneration, the display will go to dual mode with one display showing the regeneration inhibit icon and the regeneration request continuously displayed at the bottom of the screen. Further, the Auto Regeneration request message will re-display every 30 minutes. The machine can continue to operate with Reset Regeneration inhibited for 3 hours, however, after 3 hours, a Stationary Regeneration request may occur.



RESET REGENERATION STANDBY DUE TO LOW DOC TEMPERATURE

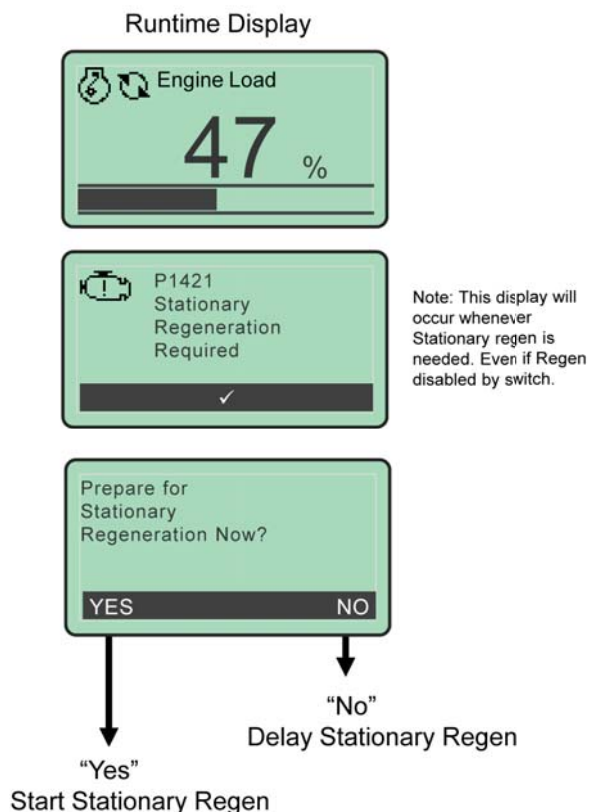
For Reset Regeneration to begin, the DOC temperature has to be at a sufficient level. If the DOC has not reached this temperature and Reset Regeneration is required, then a notification to Increase RPM/Load and the Regeneration icon will be displayed. Once the DOC reaches sufficient temperature, Reset Regeneration will begin and a notification and regeneration icon will display at the bottom of the screen.



STATIONARY REGENERATION BY ENGINE MANAGEMENT

If the ECU determines that performing the Stationary Regeneration is required, the operator will be alerted via the control panel that a Stationary Regeneration is required via a Diagnostic Trouble Code (DTC) even if Regeneration on the control panel is set to Inhibit. The operator should immediately conduct the Stationary Regeneration by performing the following operation.

1. Move the machine to a well-ventilated and safe location.
2. Acknowledge the DTC by pressing the middle soft key on the display marked "✓".
3. When the message "Prepare for Stationary Regeneration Now" is displayed, press the left soft key marked "YES".
4. When the message "Bring Machine to Lo-idle Speed and confirm interlocks" is displayed, make sure that the PTO clutch is disengaged and reduce engine speed to low idle. Then acknowledge the message by pressing the middle soft key on the display marked "✓".
5. When the message "Ready to begin Stationary Regeneration Now?" is displayed, press the left soft key marked "YES".



Note: Stationary Regeneration will not begin if any of the following conditions are present:

- Coolant temperature is less than 60° C (140° F)
- The engine has not been running for 15 minutes
- An important DTC is active
- The interlock switch is off (PTO clutch is engaged)
- Idle speed is too high

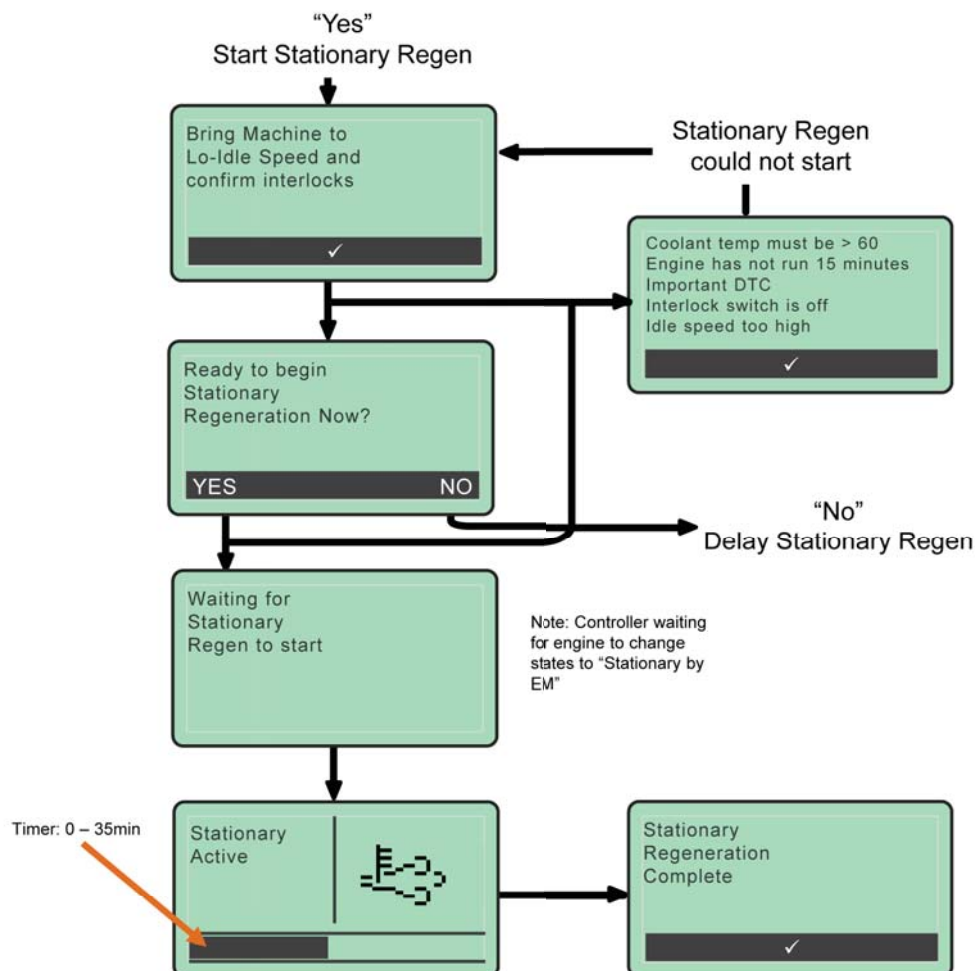
If these conditions are present, a notification will be displayed. Once these conditions are corrected by the operator, acknowledge the message and Stationary Regeneration will begin.

6. At this point, the ECU will take over control of the engine to perform the Stationary Regeneration and a notification of “Stationary Active” and the regeneration icon will be display along with a status bar (0 to 35 minutes) at the bottom of the screen.

Note: When the Stationary Regeneration starts, the engine speed increases gradually to high idle speed, then the regeneration begins and may modulate engine speed throughout the process.

Note: If Stationary Regeneration needs to be interrupted for any reason, turn off the key switch. One the machine is restarted, the Stationary Regeneration request will be repeated.

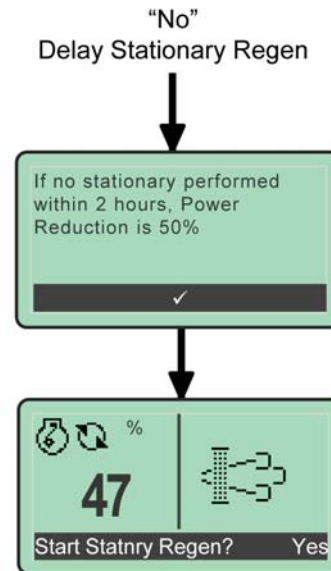
7. Once Stationary Regeneration is complete, a notification will be displayed and the engine will return to low idle, but will not automatically turn off. Normal machine operation can resume.



STATIONARY REGENERATION BY ENGINE MANAGEMENT (CONTINUED)

If the Stationary Regeneration is delayed by pressing the right soft key marked “**NO**” when the request is displayed, a 15% power reduction is immediately applied to the engine. A notification stating that “If no stationary performed within 2 hours, Power Reduction is 50%” will also be displayed. Once this message is acknowledged by pressing the middle soft key on the display marked “✓”, the regeneration icon will be displayed and the regeneration request will remain at the bottom of the screen.

Note: Although not recommended, the engine can be run in Stationary Standby mode (delaying Stationary Regeneration) for a total of 10 hours. For the first 2 hours, the engine power will be reduced to 85%. For the remaining 8 hours, engine power will be reduced to 50%. If the Stationary Regeneration is not performed when requested by the ECU, an excessive amount of PM will accumulate. Abnormal combustion of PM may cause damage to the DPF after extended operation in Stationary Standby mode.



Engine can be run in Stationary Standby Mode for 10 hours.

First 2 hours: 15% fuel cut

Next 8 hours: 50% fuel cut

MANUAL STATIONARY REGENERATION - OPERATOR REQUEST

The operator has the option of performing a Manual Stationary Regeneration should work conditions/schedule require. This is accomplished via the display [Main Menu “➡” Regeneration “➡” Regeneration Start]. Manual Stationary Regeneration can only be completed after the engine has accumulated 50 hours or more since its last regeneration.

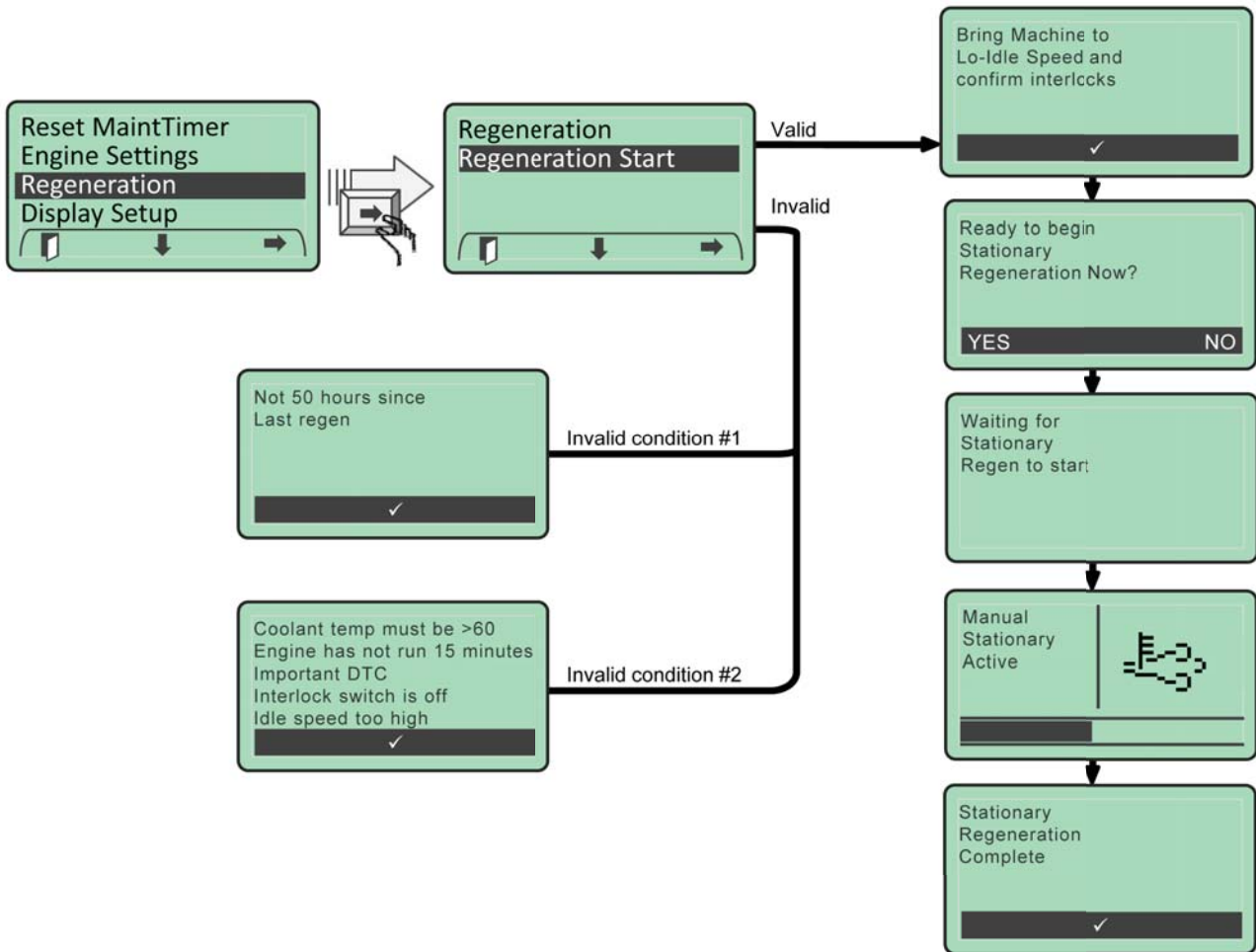
1. Move the machine to a well-ventilated and safe location.
2. When the message “Bring Machine to Lo-idle Speed and confirm interlocks” is displayed, make sure that the PTO clutch is disengaged and reduce engine speed to low idle. Then acknowledge the message by pressing the middle soft key on the display marked “✓”.
3. When the message “Ready to begin Stationary Regeneration Now?” is displayed, press the left soft key marked “**YES**”.

Note: Stationary Regeneration will not begin if any of the following conditions are present:

- Coolant temperature is less than 60° C (140° F)
- The engine has not been running for 15 minutes
- An important DTC is active
- The interlock switch is off (PTO clutch is engaged)
- Idle speed is too high

If these conditions are present, a notification will be displayed. Once these conditions are corrected by the operator, acknowledge the message and Stationary Regeneration will begin.

MANUAL STATIONARY REGENERATION - OPERATOR REQUEST (CONTINUED)



4. At this point, the ECU will take over control of the engine to perform the Stationary Regeneration and a notification of “Stationary Active” and the regeneration icon will be display along with a status bar (0 to 35 minutes) at the bottom of the screen.

Note: When the Stationary Regeneration starts, the engine speed increases gradually to high idle speed, then the regeneration begins and may modulate engine speed throughout the process.

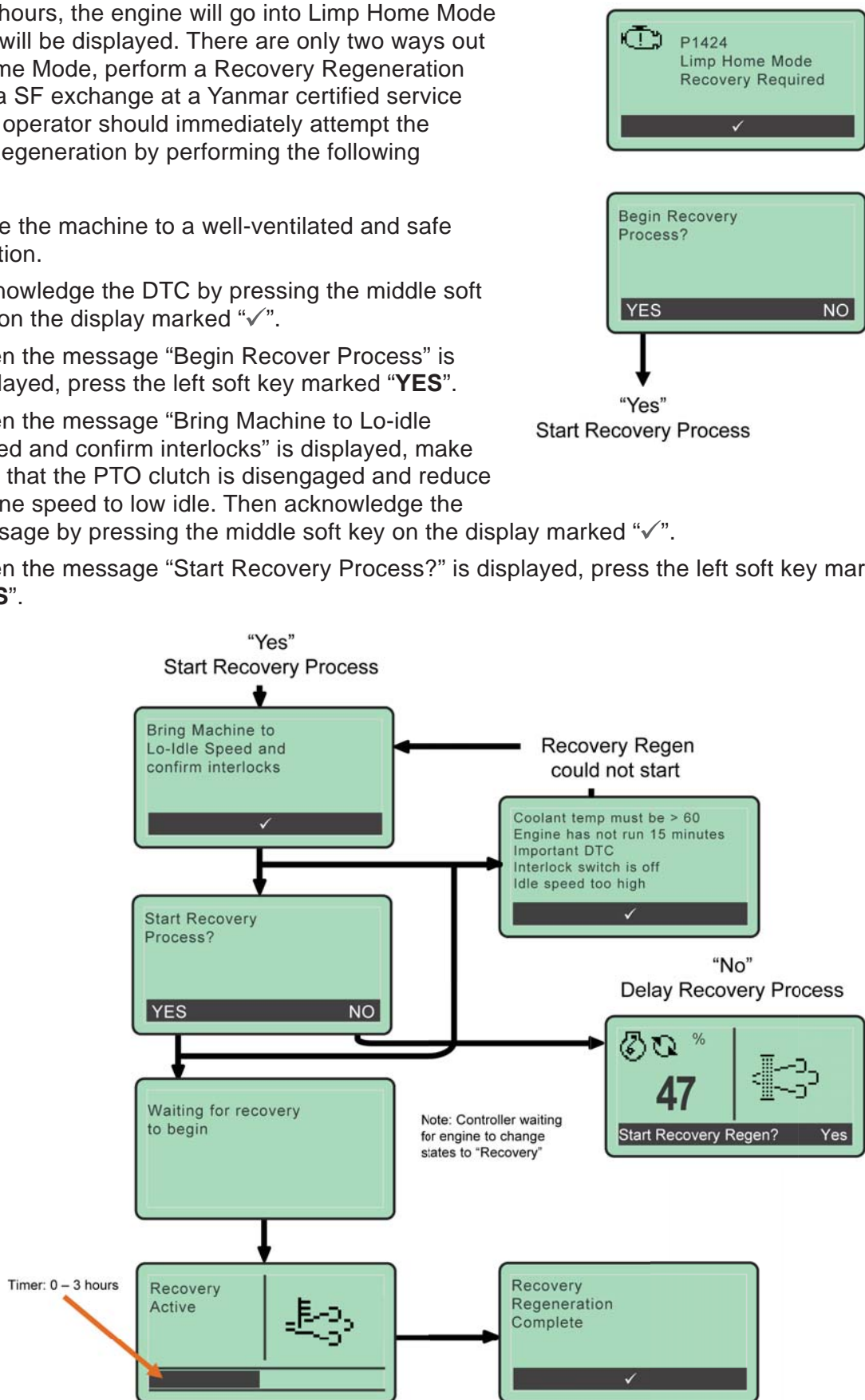
Note: If Stationary Regeneration needs to be interrupted for any reason, turn off the key switch. One the machine is restarted, the Stationary Regeneration request will be repeated.

5. Once Stationary Regeneration is complete, a notification will be displayed and the engine will return to low idle, but will not automatically turn off. Normal machine operation can resume.

RECOVERY REGENERATION

If Recovery Regeneration is not performed within the allowed 10 hours, the engine will go into Limp Home Mode and a DTC will be displayed. There are only two ways out of Limp Home Mode, perform a Recovery Regeneration or perform a SF exchange at a Yanmar certified service center. The operator should immediately attempt the Recovery Regeneration by performing the following operation.

1. Move the machine to a well-ventilated and safe location.
2. Acknowledge the DTC by pressing the middle soft key on the display marked "✓".
3. When the message "Begin Recover Process" is displayed, press the left soft key marked "YES".
4. When the message "Bring Machine to Lo-idle Speed and confirm interlocks" is displayed, make sure that the PTO clutch is disengaged and reduce engine speed to low idle. Then acknowledge the message by pressing the middle soft key on the display marked "✓".
5. When the message "Start Recovery Process?" is displayed, press the left soft key marked "YES".



RECOVERY REGENERATION (CONTINUED)

Note: Recovery Regeneration will not begin if any of the following conditions are present:

- Coolant temperature is less than 60° C (140° F)
- The engine has not been running for 15 minutes
- An important DTC is active
- The interlock switch is off (PTO clutch is engaged)
- Idle speed is too high

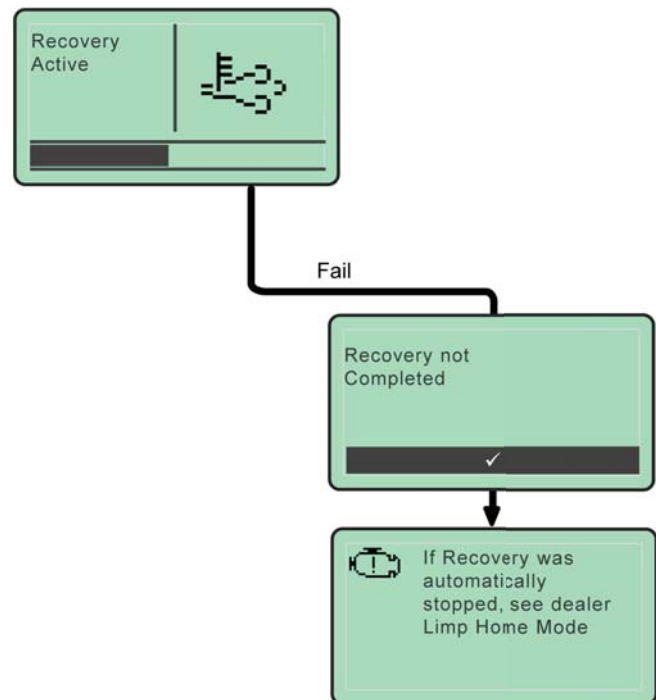
If these conditions are present, a notification will be displayed. Once these conditions are corrected by the operator, acknowledge the message and Stationary Regeneration will begin.

6. At this point, the ECU will take over control of the engine to perform the Recovery Regeneration and a notification of "Recovery Active" and the regeneration icon will be display along with a status bar (0 to 3 hours) at the bottom of the screen.

Note: When the Recovery Regeneration starts, the engine speed increases gradually to high idle speed, then the regeneration begins and may modulate engine speed throughout the process.

Note: If Recovery Regeneration needs to be interrupted for any reason, turn off the key switch. One the machine is restarted, the Recovery Regeneration request will be repeated.

7. If the Recovery Regeneration is successful, a notification will be displayed and the engine will return to low idle, but will not automatically turn off. Normal machine operation can resume.
8. If the Recovery Regeneration is not successful, a notification will be displayed. Stop the engine and see a Yanmar certified service center for a Soot Filter exchange.



There are 2 ways out of Limp Home:

1. Perform a Recovery Regeneration
2. Perform a Soot Filter exchange with SA-D

CLEANING AND MAINTENANCE

Before servicing the machine, turn off engine and allow all moving parts to stop. Disconnect the battery cables to prevent accidental starting of the machine. Tag the engine operating area to show that the machine is being serviced. Use lockout/tagout procedure (29 CFR 1910.147).



AFTER FIRST 4 TO 8 HOURS OF OPERATION

1. Check and adjust clutch.
2. Torque wheel lugs. Torque again after 7 days (Trailer option only).

DAILY CLEAN-UP MAINTENANCE

Follow this procedure daily to keep the equipment in good operating condition:

1. Clean the air cleaner following the instructions in the engine operator's manual.
2. Check air cleaner connections. If they loosen or become disconnected, the warranty on your engine is subject to cancellation.
3. Clean radiator and radiator guard with tap water.

NOTICE

Never use high-pressure water or compressed air at greater than 28 psi (193 kPa; 19686 mmHg) or a wire brush to clean the radiator fins.

Radiator fins damage easily.

4. Clean beater chains. Make sure to remove all twine, wire, and other foreign objects. Check pins and nuts.
5. Lock the discharge tube into place.
6. Check engine oil level and fill as necessary.
7. Check hitch bolts and safety chains. Repair or replace as necessary.

WEEKLY MAINTENANCE

After each 50 hours of operation, follow this procedure:

1. Change engine oil, following engine manufacturer's recommendations, after the first 50 hours and every 250 hours thereafter.
2. Change engine oil filter cartridge with every oil change.
3. Lubricate bearings with general-purpose chassis lubricant, using a grease gun. Wipe each bearing before lubrication to remove dirt and prevent overheating.
4. Inflate tires to the pressure indicated on the sidewalls and trailer data plate.
5. Check clutch adjustment to ensure that it "snaps" in and out of engagement.

CAUTION

Perform maintenance only while engine is off. Failure to comply could result in minor to moderate personal injury. Failure to comply could also result in product or property damage.

LUBRICATION AND FLUIDS CHART

Ref. No.	Location	Lubricant	Frequency	Number
1.	Grease drive shaft bearings.	GR	Weekly	2
2.	Repack wheel bearings.	GR	Annually	2
3.	Check engine oil level.	MO	Daily	1
4.	Check air cleaner.		Daily	1
5.	Change engine oil and filter.	MO	See Engine Manual	1
6.	Grease PTO release bearing.	GR	Daily	1
7.	Grease PTO main shaft bearing.	GR	Weekly	1
8.	Grease PTO cross shaft.	GR	Weekly	2
9.	Change engine coolant.	AF	See Engine Manual	1
10.	Check fuel tank level.	DF	Daily	1
11.	Check engine coolant.	AF	Daily	1
12.	Drain/Check fuel filter/water separator.	DF	Daily	1
13.	Replace fuel filter/water separator.	DF	See Engine Manual	1
14.	Replace fuel filter.	DF	See Engine Manual	1

LUBRICANT OF FLUID USED

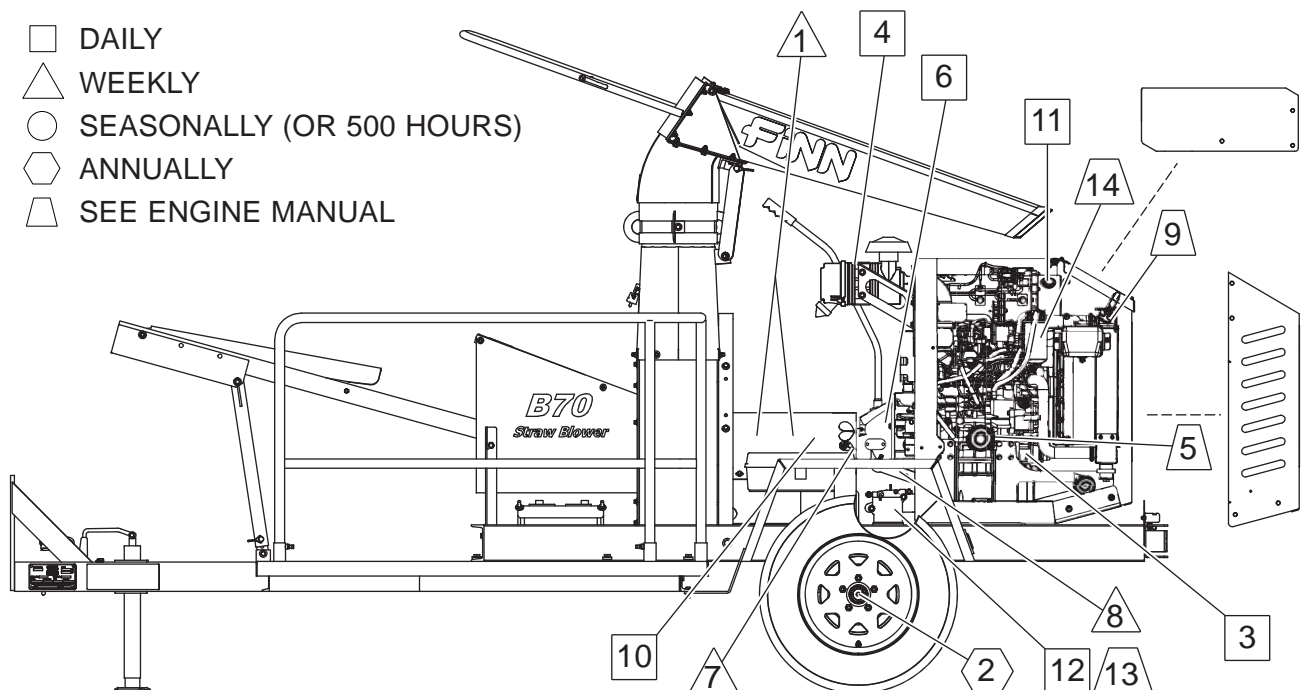
GR Grease, NLGI Grade 2 EP with lithium complex thickener
MO See engine operator's manual
AF See engine operator's manual
DF Ultra Low Sulfur Diesel Fuel

FLUID CAPACITIES

Fuel - 11 gal (42 L)
Engine Oil - See engine manual
Engine Coolant - See engine manual

TIME KEY

- DAILY
- △ WEEKLY
- SEASONALLY (OR 500 HOURS)
- ◇ ANNUALLY
- ▴ SEE ENGINE MANUAL



CLUTCH CARE AND MAINTENANCE

This is an outline of the PTO clutch adjustment and lubrication procedure. When you perform maintenance beyond this outline, refer to the power take-off manufacturer's service manual. In order to properly identify parts when ordering replacement parts, always refer to the unit and specification number stamped on the nameplate located on the top center of the power take-off housing.

LUBRICATION

The operating shaft bearing (located where the drive shaft exits the PTO housing) should be lubricated every one (1) to three (3) months, depending on usage. The PTO cross shaft should be lubricated weekly. The PTO release bearing, accessible by removing the PTO nameplate, should be lubricated daily using a hand operated grease gun only.

ADJUSTMENT

The clutch described in this manual does not automatically adjust to compensate for wear of the clutch facing(s), and must be manually adjusted. Maintaining the correct engagement pressure is the responsibility of the owner/operator. The owner/operator must periodically adjust the clutch to ensure correct clutch operation.

The clutch should be adjusted if the force to engage the clutch drops by 10-15% of the specified engagement force. Destructive damage may have already occurred if engagement force is allowed to diminish to the point where the clutch fails to carry the load (slippage), or if facing(s) has (have) overheated.

NOTICE

Do not adjust clutch too tightly. Overtightening can cause component failure.

If the clutch requires adjustment, remove the PTO nameplate, disengage the clutch and rotate it to gain access to the adjusting ring lock.

With a flat blade screwdriver or 7/16 inch wrench, loosen the adjustment lock bolt and loosen or remove the adjustment lock.

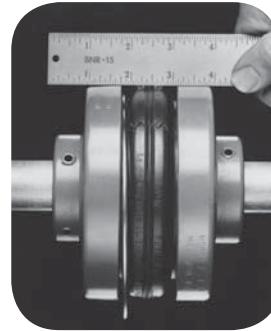
Rotate the adjusting ring counter-clockwise to tighten the clutch. Rotating the adjustment ring clockwise will loosen the clutch. Adjust to obtain the proper handle engagement force. Handle force should be measured with a spring scale at the end of the handle and pulling perpendicular to the handle. Engagement force should be 31 to 35 lbs. on trailer units and 34 to 38 lbs. on skid units.

When clutch is properly adjusted, reposition the adjustment lock in the notches. Install and tighten the adjustment lock bolt. Rotate clutch and re-engage. Reinstall the PTO nameplate.

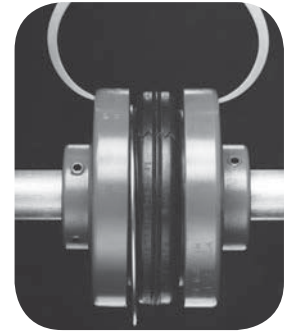
COUPLING MAINTENANCE

Coupling alignment should be checked seasonally or every 500 hours.

1. Remove coupling guard.
2. Check parallel alignment by placing a straight-edge across the two coupling flanges and measuring the maximum offset at various points around the periphery of the coupling without rotating the coupling. If the maximum offset exceeds 0.025 in., re-align the shafts.
3. Check angular alignment with a micrometer or caliper. Measure from the outside of one flange to the outside of the other at intervals around the periphery of the coupling. Determine the maximum and minimum dimensions without rotating the coupling. The difference between the maximum and minimum must not exceed 0.109 in. If a correction is necessary, be sure to recheck the parallel alignment.



Parallel



Angular

4. Reinstall coupling guard.

Note: PTO shaft height is adjusted by loosening the bolts that attach the engine mounting feet to the engine block, adjusting the engine position and re-tightening the bolts. The PTO shaft lateral position is adjusted by loosening the 6 bolts that attach the engine mount adapter plate to the machine frame, adjusting the engine position and re-tightening the bolts. It is not recommended that the four engine isolator mounts be loosened to perform coupling alignment. The compliance of the rubber mounts makes this difficult.

FINN B70 Straw Blower TECHNICAL SPECIFICATIONS

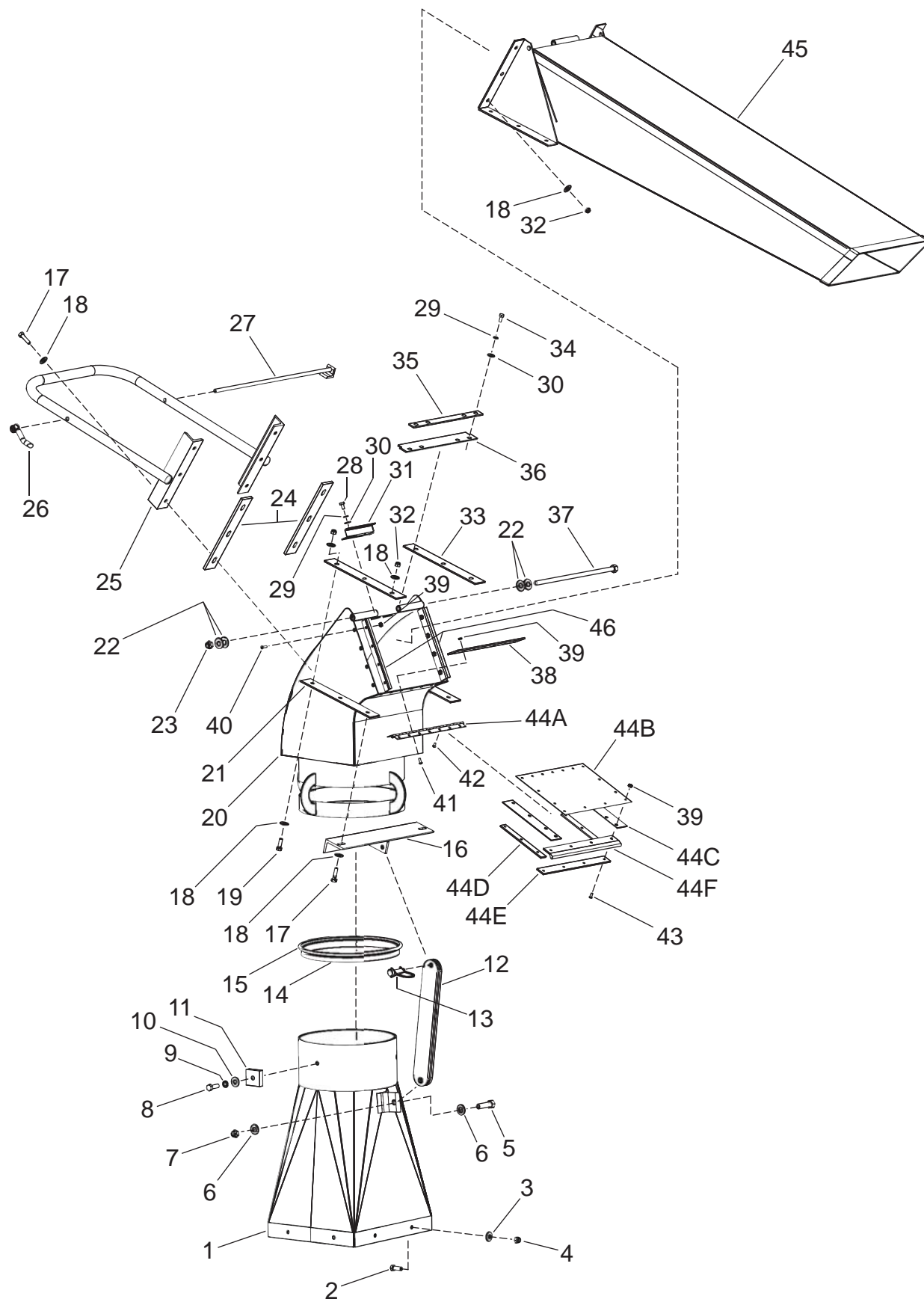
POWER	Yanmar 3TNV88C-DYEM, 35.1hp (26.2kW), 3 cylinder water cooled diesel engine. Tier 4Final. 1.642 L	
ENGINE SAFETY SYSTEM	Low oil pressure, Electronic engine control and monitoring	
CAPACITY	Up to 7 tons of hay or straw per hour	
FUEL TANK CAPACITY	11 gallon (41.6 L)	
BLOWER	Dynamically balanced, 21 in. (53 cm) diameter fan with 6 blades developing a discharge velocity greater than 150 mph (240 km/h)	
RANGE	60 ft. (18m) in still air	
FEED	Manual	
BEATER CHAMBER	3.5 cu. ft. (99 liter) with removable beater chains	
DISCHARGE SPOUT	Block bearing mounted. 360 degrees horizontal rotation and 70 degrees vertical travel	
TRAILER OPTION	Independent suspension rubber torsion axle, with electric brakes, ST205/75015 load range C tires, fenders, D.O.T highway lights, dual skid proof operator platforms, parking jack, 2 in. (5 cm) ball or heavy-duty lunette ring	
FEED TRAY	Folding tray, adjustable height to meet bed of supply vehicle	
DRIVE	Blower fan in-line coupled to over-center clutch with flexible coupling and two pillow block bearings	
WEIGHT*	B70S	1,700 lbs. (771 kg)
	B70T	2,360 lbs. (1070 kg)

* Working weights are approximate and do not include options or stored materials.

B70 Straw Blower

Parts Manual

Model MN



**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**

DISCHARGE ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	031247	Transition Assembly	1
2	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1 LG. Grade 5	8
3	●	Plain Washer, 3/8 Regular Type B	8
4	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	8
5	●	Hex Head Cap Screw, 1/2 - 13 UNC - 1.75 LG. Grade 5	1
6	●	Plain Washer, 1/2 Narrow Type A	2
7	●	Prevailing Torque Hex Nut, 1/2 All Metal Type	1
8	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	3
9	●	Regular Helical Spring Lock Washer, 3/8	3
10	●	Plain Washer, 3/8 Regular Type B	3
11	031018-01	Elbow Bearing	3
12	031243-04	Discharge Tube Hold Down Arm	1
13	FW71225	Snapper Pin	1
14	031109	Seal Banding	1
15	031086	Transition Seal	1
16	031243-01	Discharge Tube Hold Down Bracket	1
17	●	Hex Head Cap Screw, 5/16 - 18 UNC - 1.25 LG. Grade 5	8
18	●	Plain Washer, 5/16 Regular Type B	24
19	●	Hex Head Cap Screw, 5/16 - 18 UNC - 1 LG. Grade 5	10
20	031239	Elbow Weldment	1
21	031242-07	Elbow Side Seal Retaining Plate	2
22	●	Plain Washer, 7/16 Regular Type B	4
23	●	Prevailing Torque Hex Nut, 7/16 All Metal Type	1
24	031242-03	Elbow Seal - Upper	2
25	031241	Elbow Handle - Trailer Only	1
25	031241-05	Elbow Handle - Skid And Right Hand Feed Only	1
26	031258	Lever Nut	1
27	031243-12	Elbow Tensioning Rod	1
28	●	Hex Head Cap Screw, 1/4 - 20 UNC - 0.5 LG. Grade 5	2
29	●	Regular Helical Spring Lock Washer, 1/4	6
30	●	Plain Washer, 1/4 Narrow Type A	2
31	031238-05	Hinge Seal	1
32	●	Prevailing Torque Hex Nut, 5/16 All Metal Type	12
33	031242-04	Elbow Seal - Lower	2
34	●	Hex Head Cap Screw, 1/4 - 20 UNC - 0.625 LG. Grade 5	4

Continued to next page.

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DISCHARGE ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
35	031338-10	Top Seal Retaining Plate	1
36	031338-09	Top Seal	1
37	031243-08	Elbow Hinge Rod	1
38	031338-11	Hinge Seal	1
39	●	Keps Nut, No. 10 - 24	30
40	●	Slotted Flat Head Machine Screw, No. 10 - 24 x 0.625 LG.	8
41	●	Slotted Round Head Machine Screw, No. 10 - 24 x 0.5 LG.	7
42	●	Slotted Round Head Machine Screw, No. 10 - 24 x 0.375 LG.	5
43	●	Slotted Flat Head Machine Screw, No. 10 - 24 x 0.5 LG.	10
44	031341	Seal Plate Assembly	1
44A	031338-01	Seal Plate Hinge	1
44B	031238-04	Bottom Seal Plate	1
44C	031338-08	Side Seal	2
44D	031338-07	Side Retaining Plate	2
44E	031338-03	End Flap Seal Retainer	1
44F	031338-04	End Flap Seal	1
45	031240	Discharge Tube	1
46	031338-12	Side Elbow Seal	2

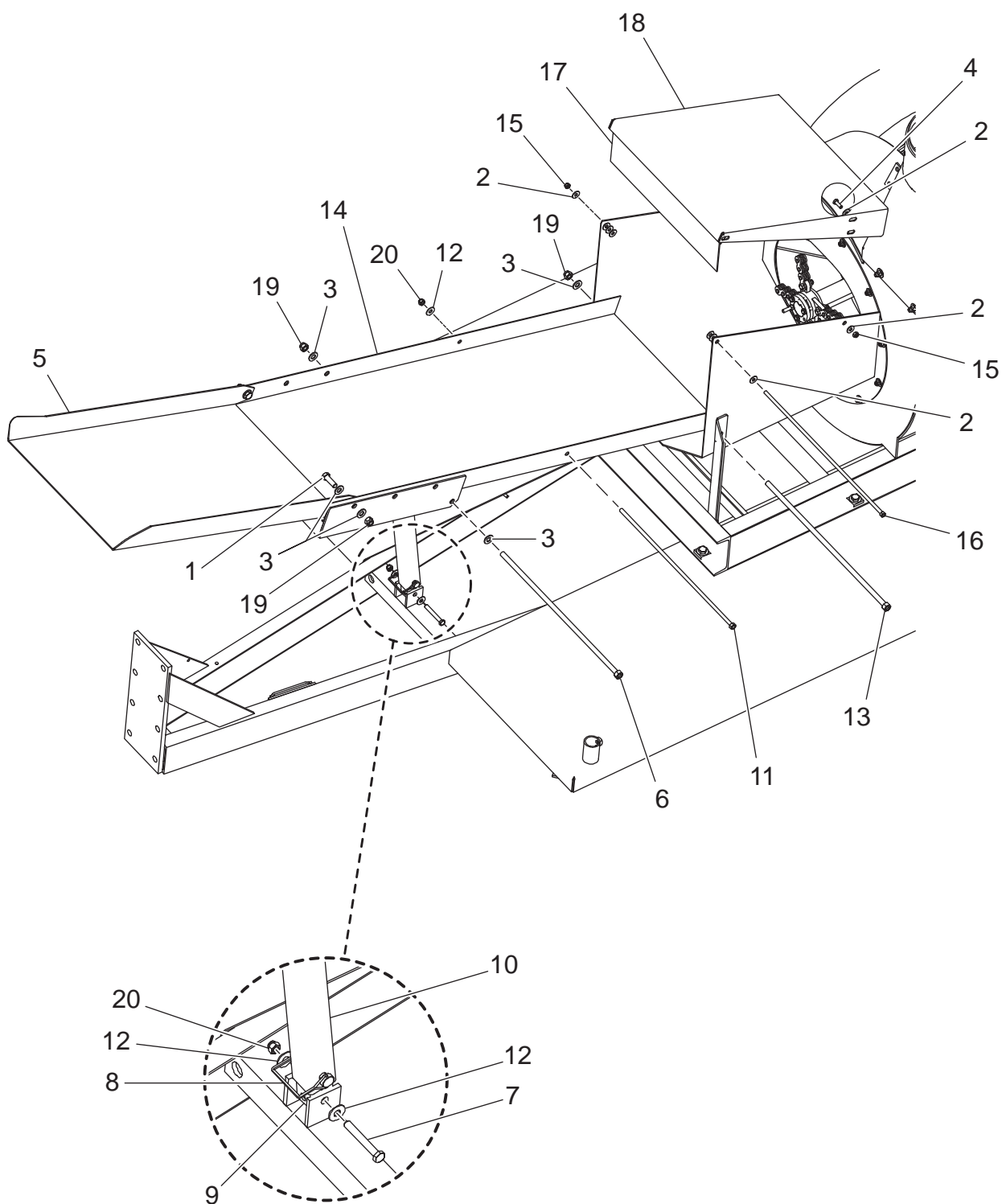
KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

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SHREDDER BOX AND FEED CHUTE

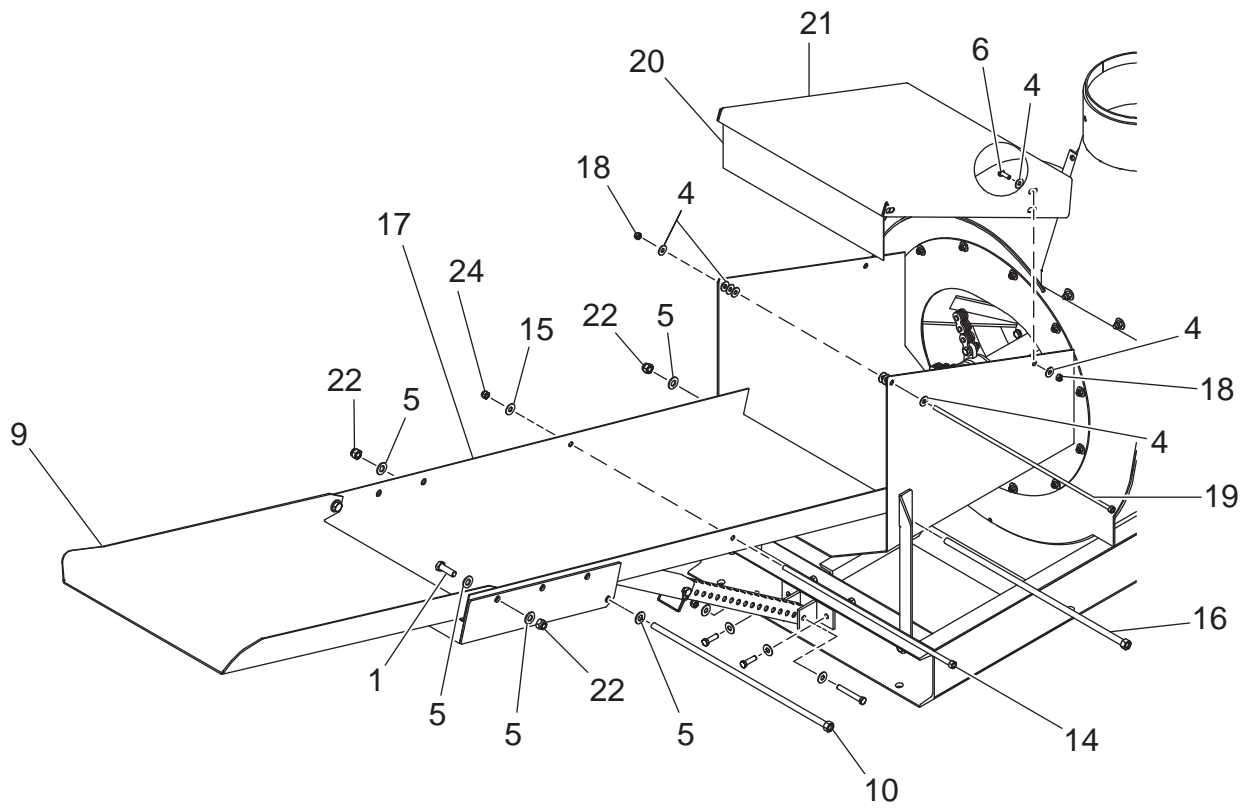
(STANDARD TRAILER MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	●	Hex Head Cap Screw, 1/2 - 13 UNC - 1.5 LG. Grade 5	2
2	●	Plain Washer, 5/16 Regular Type B	12
3	●	Plain Washer, 1/2 Narrow Type A	11
4	●	Hex Head Cap Screw, 5/16 - 18 UNC - 0.875 LG. Grade 5	2
5	030898	Feed Chute Extension	1
6	031158-10	Feed Chute Support Rod	1
7	●	Hex Head Cap Screw, 3/8 - 16 UNC - 2.75 LG. Grade 5	1
8	FW71225	3/8 x 2-1/2 Quick Pin	1
9	031184-03	Lower Feed Chute Stand	1
10	031184-01	Upper Chute Stand Weldment	1
11	031158-12	Feed Chute Stop Rod	1
12	●	Plain Washer, 3/8 Regular Type B	3
13	031158-11	Chute Pivot Rod	1
14	031157	Feed Chute Weldment	1
15	●	Prevailing Torque Hex Nut, 5/16 All Metal Type	3
16	031096-04	Hinge Rod Weldment	1
17	031096-01	Shredder Door Plate	1
18	031284	Feeder Box Cover	1
19	●	Prevailing Torque Hex Nut, 1/2 All Metal Type	4
20	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	2

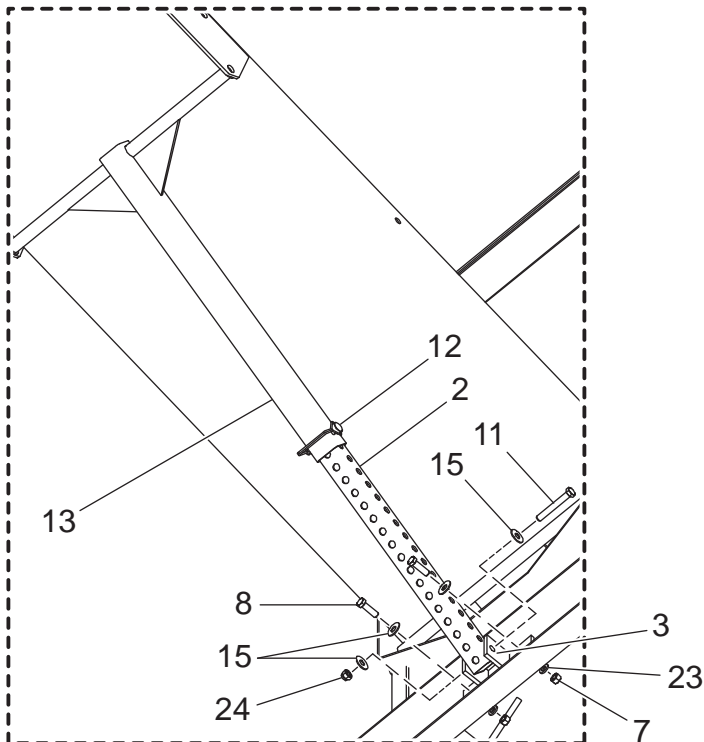
KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

**WHEN ORDERING PARTS, BE SURE TO STATE
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UNDERSIDE DETAIL



**WHEN ORDERING PARTS, BE SURE TO STATE
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SHREDDER BOX AND FEED CHUTE

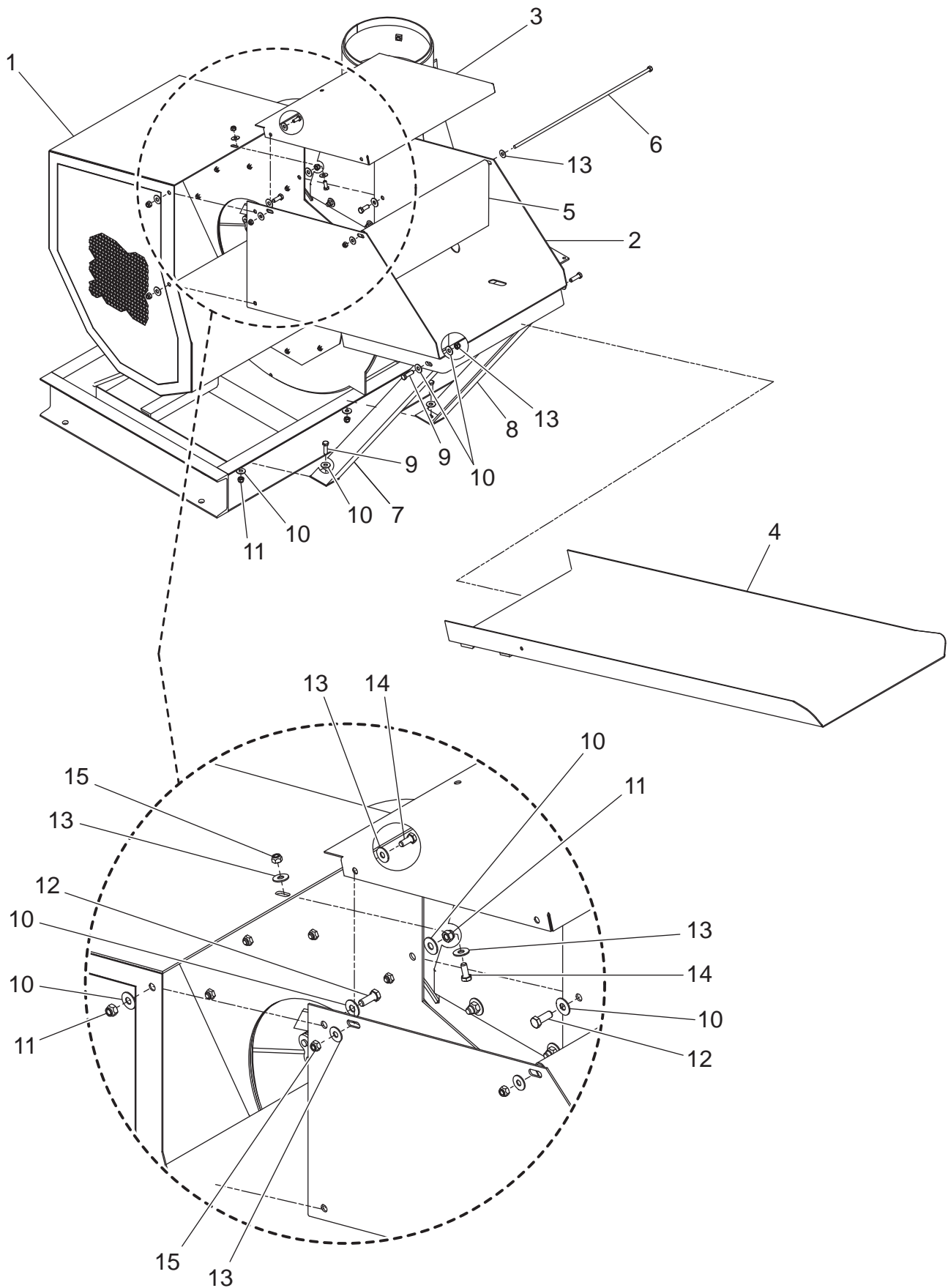
(STANDARD SKID MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	●	Hex Head Cap Screw, 1/2 - 13 UNC - 1.5 LG. Grade 5	2
2	031184-06	Lower Feed Chute Stand	1
3	031095-01	Jack Mounting Weldment	1
4	●	Plain Washer, 5/16 Regular Type B	12
5	●	Plain Washer, 1/2 Narrow Type A	11
6	●	Hex Head Cap Screw, 5/16 - 18 UNC - 0.875 LG. Grade 5	2
7	●	Hex Nut, 3/8 - 16	2
8	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	2
9	030898	Feed Chute Extension	1
10	031158-10	Feed Chute Support Rod	1
11	●	Hex Head Cap Screw, 3/8 - 16 UNC - 2.75 LG. Grade 5	1
12	FW71225	3/8 x 2-1/2 Quick Pin	1
13	031184-01	Upper Chute Stand Weldment	1
14	031158-12	Feed Chute Stop Rod	1
15	●	Plain Washer, 3/8 Regular Type B	7
16	031158-11	Chute Pivot Rod	1
17	031157	Feed Chute Weldment	1
18	●	Prevailing Torque Hex Nut, 5/16 All Metal Type	3
19	031096-04	Hinge Rod Weldment	1
20	031096-01	Shredder Door Plate	1
21	031284	Feeder Box Cover	1
22	●	Prevailing Torque Hex Nut, 1/2 All Metal Type	4
23	●	Helical Spring Lock Washer, 3/8 Regular	2
24	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	2

KITS AND MARKERS

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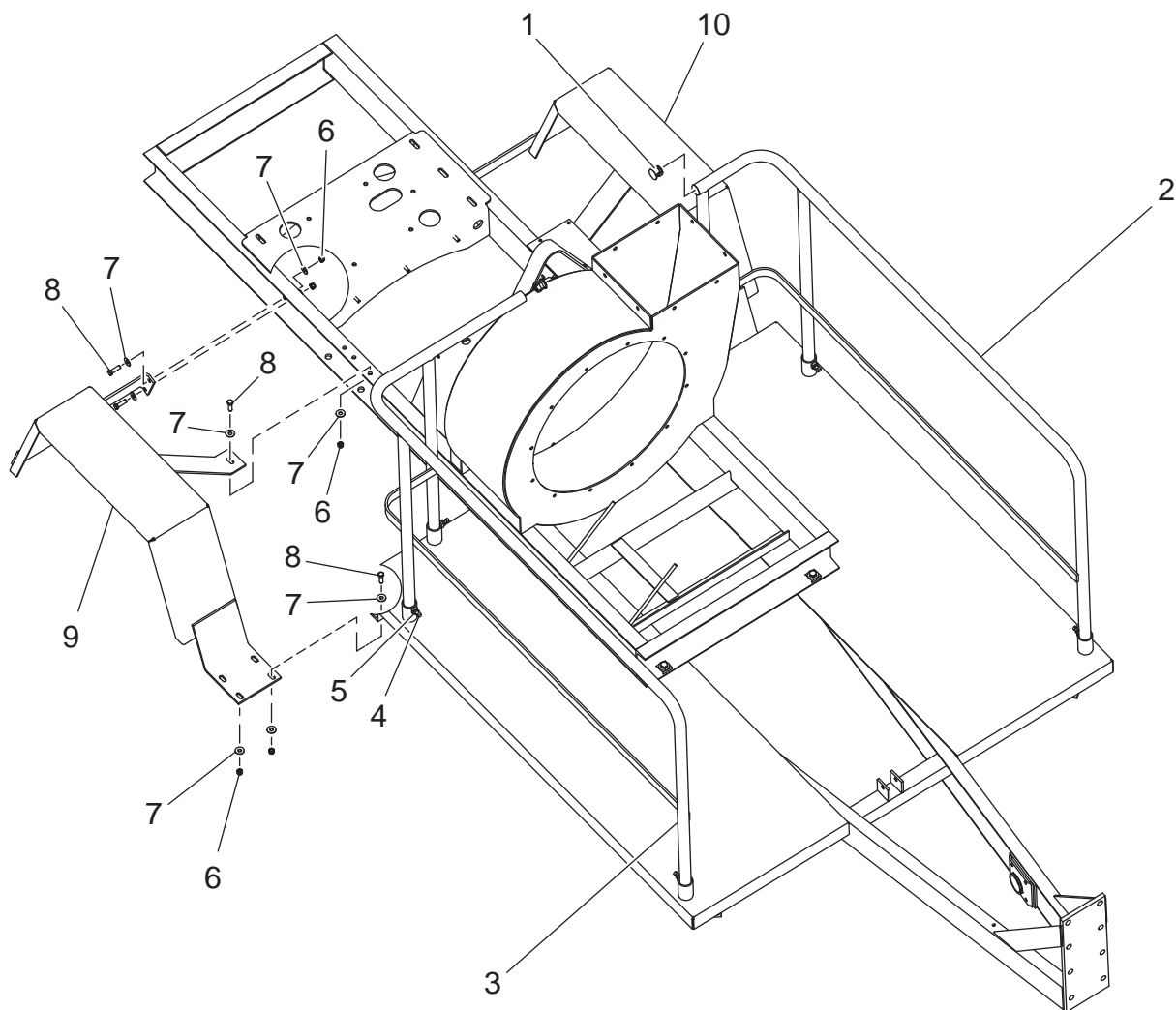
SHREDDER BOX AND FEED CHUTE (R-H MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	031292	Shredder Box Weldment	1
2	031293	Feed Chute Weldment	1
3	031289-01	Feed Chute Cover	1
4	031294	Feed Chute Extension	1
5	031295-01	Door	1
6	031096-04	Hinge Pin	1
7	031295-04	Left Leg Weldment	1
8	031295-05	Right Leg Weldment	1
9	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	4
10	●	Plain Washer, 3/8 Regular Type B	16
11	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	8
12	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1 LG. Grade 5	4
13	●	Plain Washer, 5/16 Regular Type B	8
14	●	Hex Head Cap Screw, 5/16 - 18 UNC - 0.75 LG. Grade 5	3
15	●	Prevailing Torque Hex Nut, 5/16 All Metal Type	4

KITS AND MARKERS

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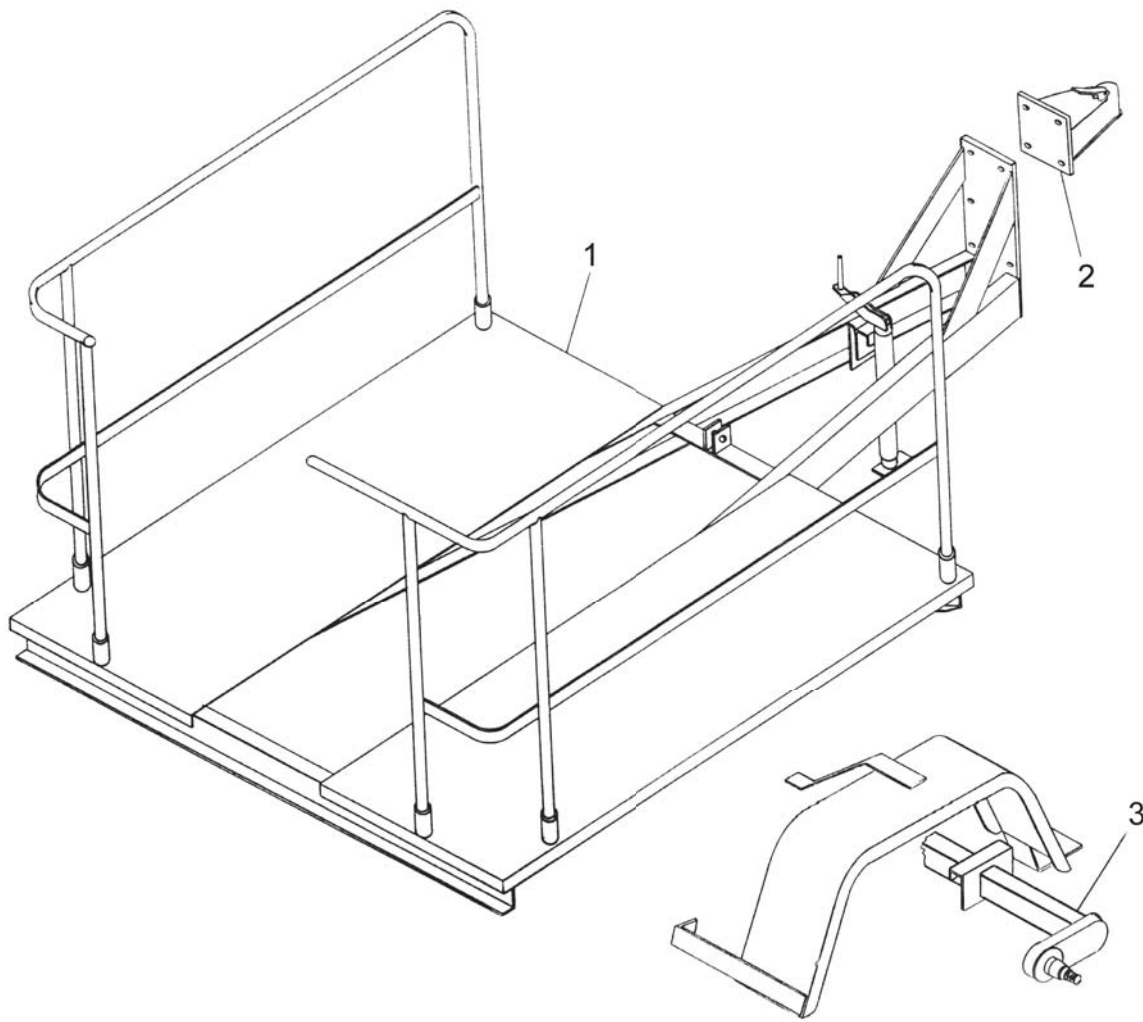
TRAILER FRAME ASSEMBLY (STANDARD TRAILER MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	004996	Pipe Plug	2
2	031183-02	Left Guard Rail Weldment	1
3	031183-01	Right Guard Rail Weldment	1
4	●	Square Head Set Screw, 3/8 - 16 UNC - 1.0 LG. Flat Point	6
5	●	Hex Nut, 3/8 - 16	6
6	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	10
7	●	Plain Washer, 3/8 Regular Type B	20
8	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	10
9	031196-01	Right Fender Weldment	1
10	031196-02	Left Fender Weldment	1

KITS AND MARKERS

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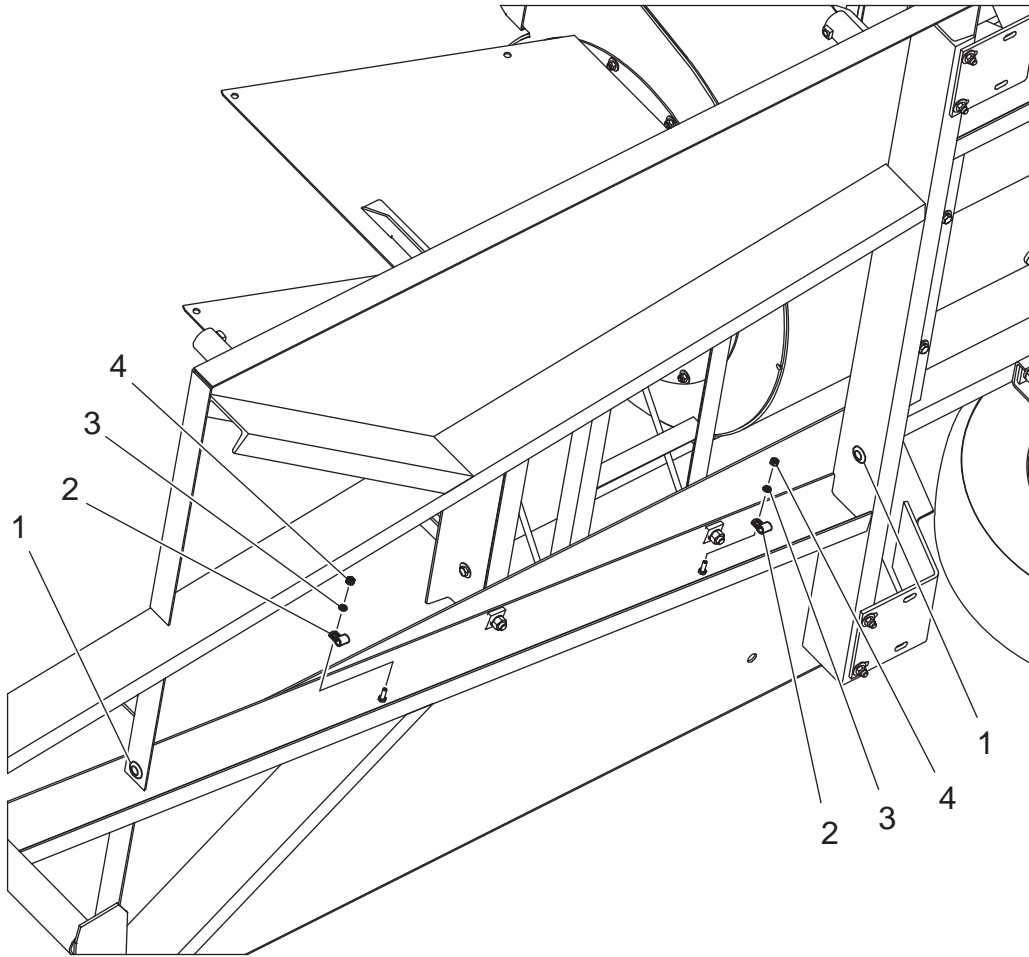


TRAILER FRAME ASSEMBLY

(STANDARD TRAILER MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	031205	Platform Assembly	1
2	031202	2 inch Ball Hitch Assembly	1
	030482	2 inch Ball (optional)	
	080043	2-1/2 inch Lunette Eye (for Pintle Hitch)	
3	031474	#3000 Rubber Torsion Axle B70 (See Trailer Wheel/Axle Assembly section for parts detail.)	1
NOT SHOWN			
	190028	Safety Chain (3 ft. Length)	2
	023915	Self-lock Clevis Hook	2
	031181	Coupling Link	2

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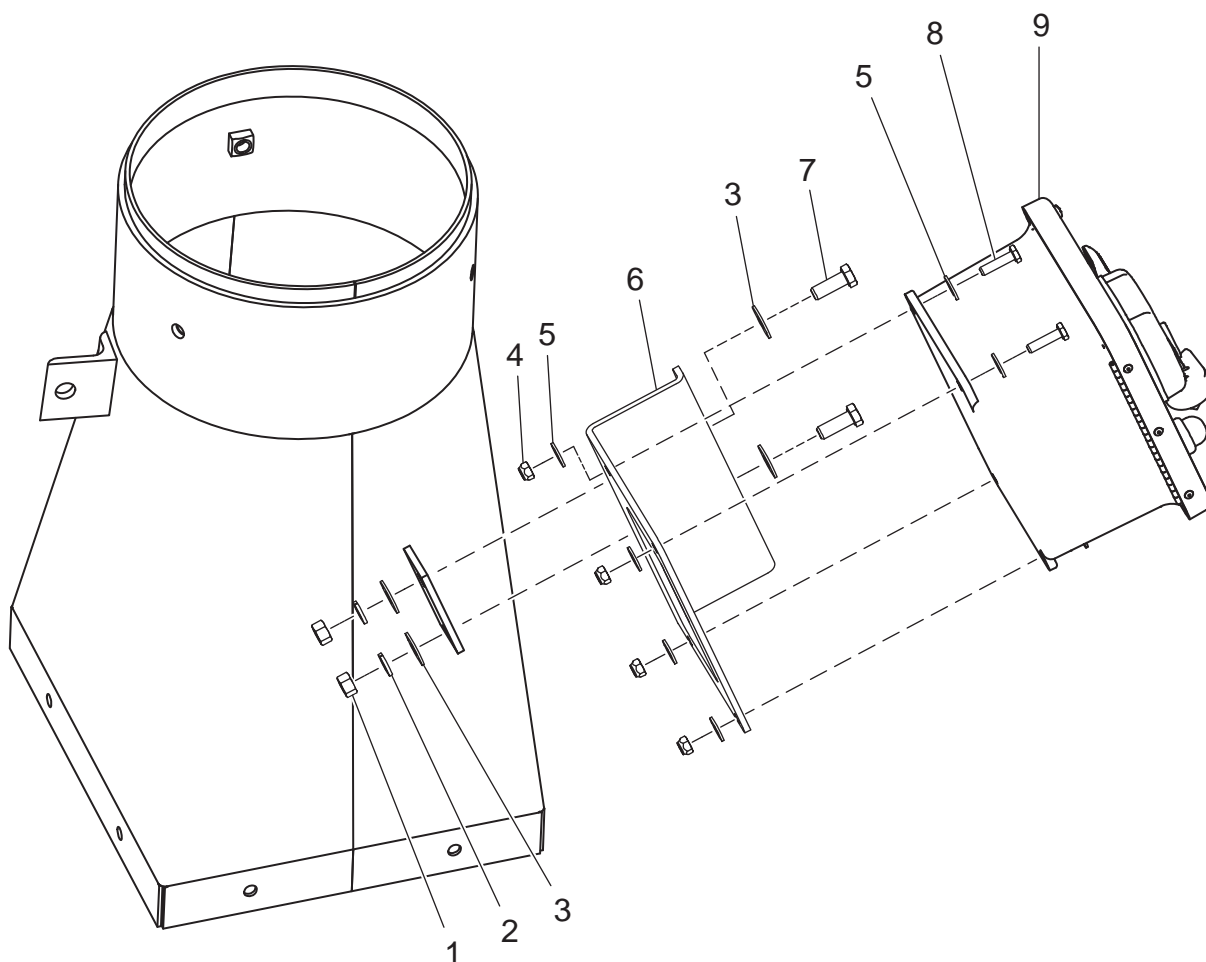
TRAILER HARNESS: GROMMETS AND CLAMPS (STANDARD TRAILER MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	004656	Rubber Grommet	2
2	060281	Loop Clamp	2
3	●	Helical Spring Lock Washer, 1/4 Regular	2
4	●	Hex Nut, 1/4 - 20	2

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

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CONTROL BOX MOUNT ASSEMBLY

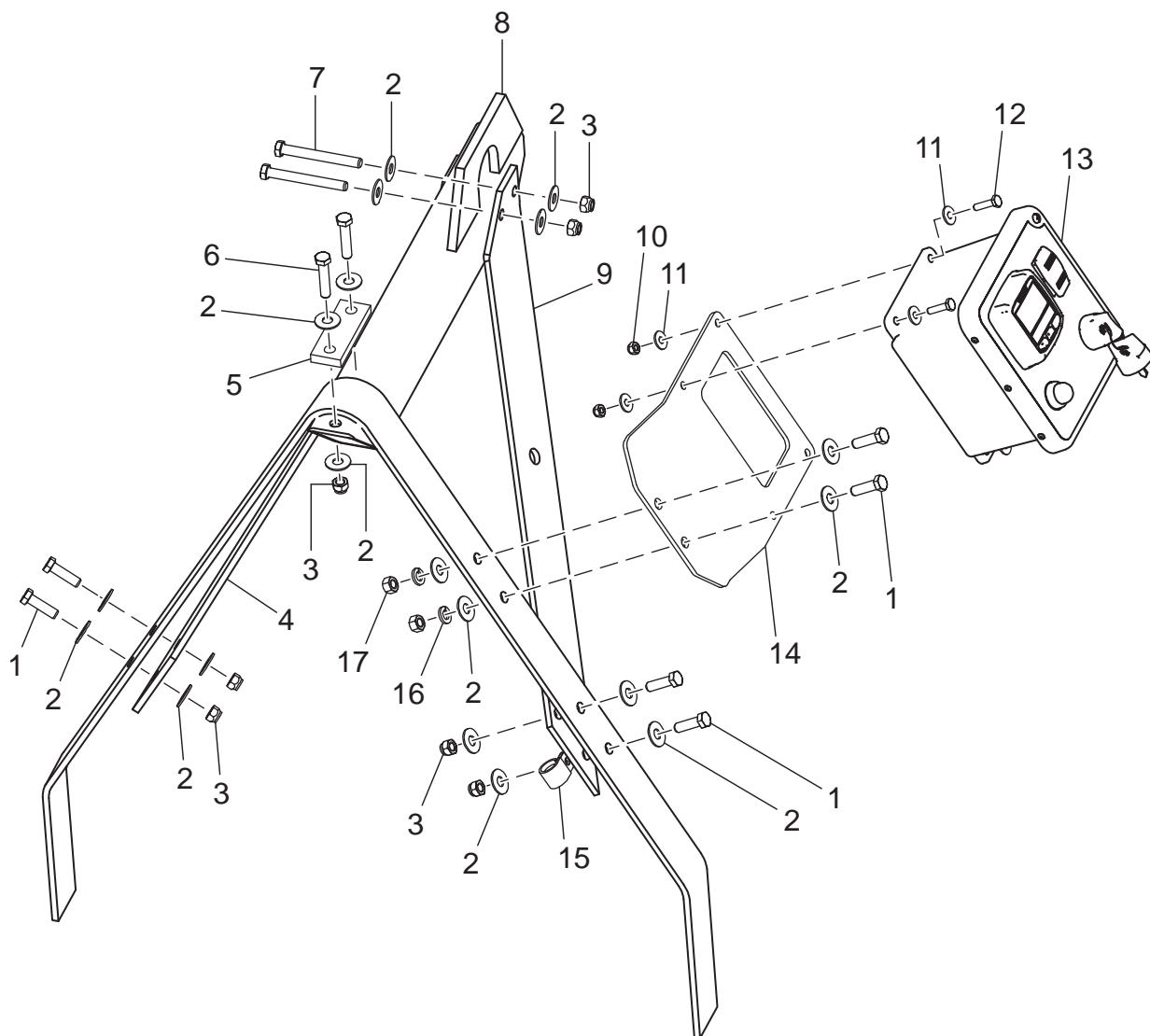
(STANDARD TRAILER MODEL)

Ref. No.	Part Number	Description	No. Req'd
1	●	Hex Nut, 3/8 - 16	2
2	●	Helical Spring Lock Washer, 3/8 Regular	2
3	●	Plain Washer, 3/8 Regular Type B	4
4	●	Prevailing Torque Hex Nut, 1/4 All Metal Type	4
5	●	Plain Washer, 1/4 Regular Type B	8
6	031490-01	Control Box Mount Bracket	1
7	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.0 LG. Grade 5	2
8	●	Hex Head Cap Screw, 1/4 - 20 UNC - 1.0 LG. Grade 5	4
9	031584	Control Box Assembly (See Control Box section for parts detail.)	1

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

**WHEN ORDERING PARTS, BE SURE TO STATE
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**WHEN ORDERING PARTS, BE SURE TO STATE
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CONTROL BOX MOUNT AND LIFT EYE ASSEMBLY

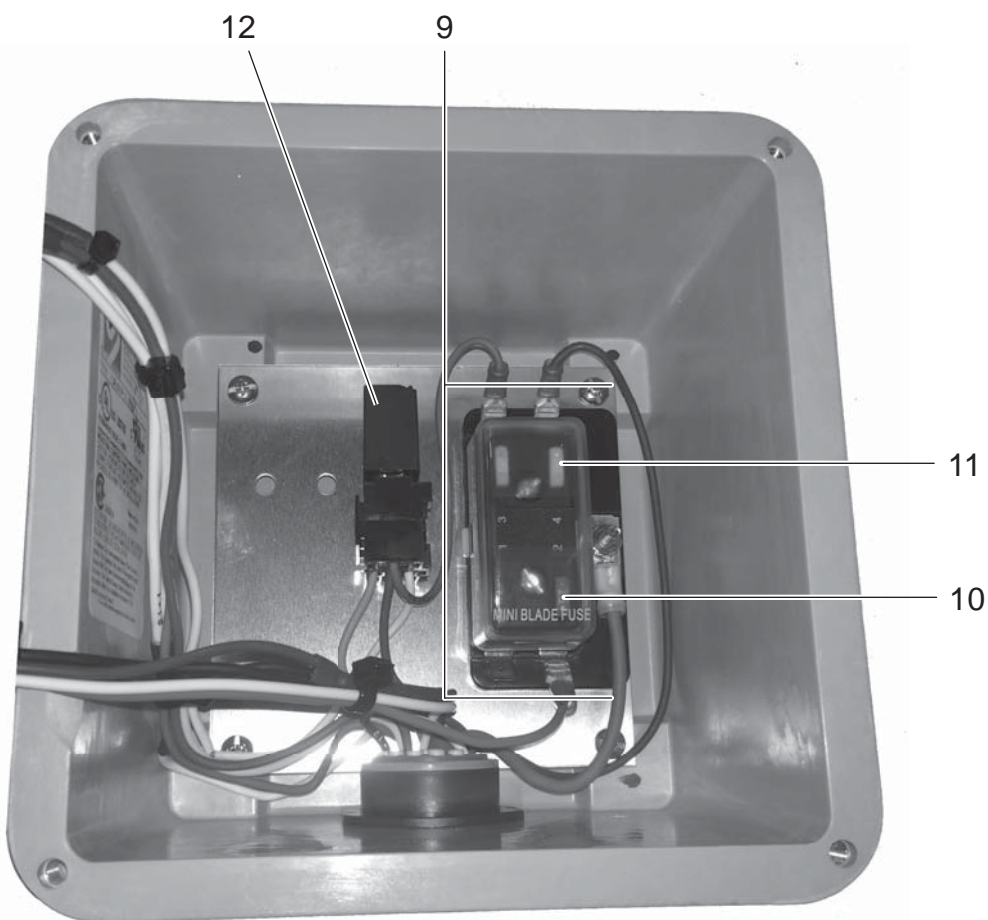
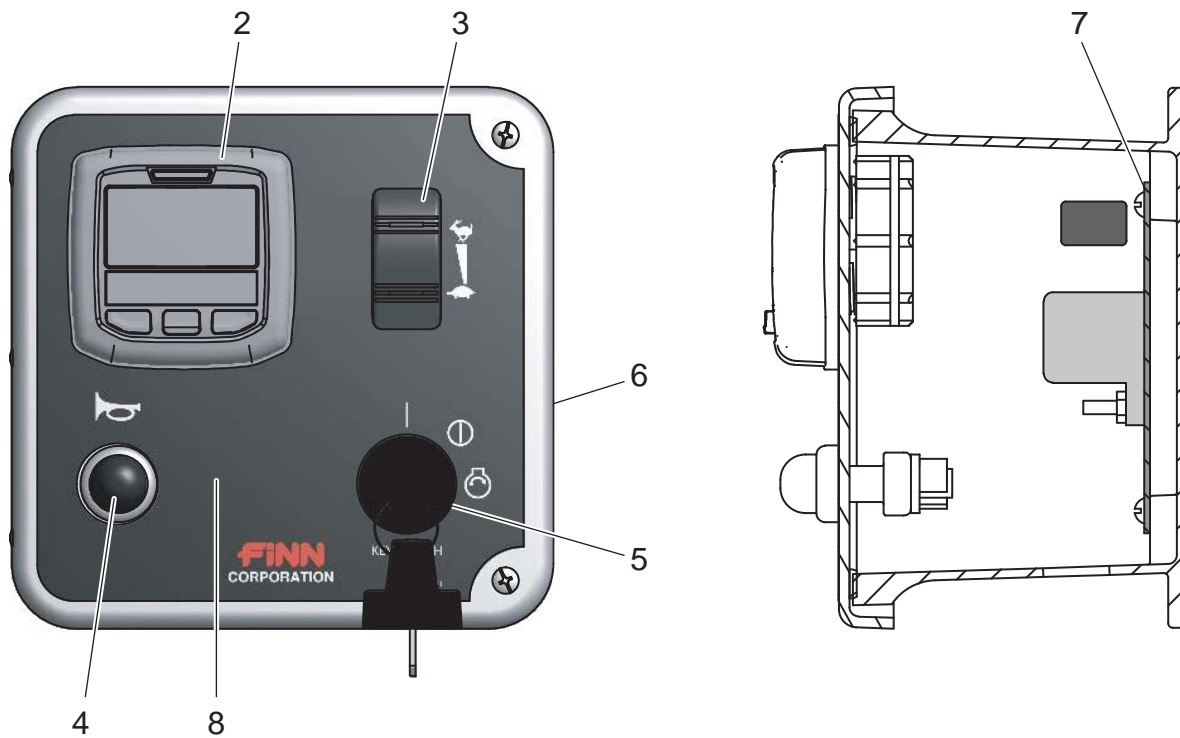
(STANDARD R-H AND SKID MODELS)

Ref. No.	Part Number	Description	No. Req'd
1	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	6
2	●	Plain Washer, 3/8 Regular Type B	20
3	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	8
4	031393-01	Support Arm (left hand side)	1
5	031326-04	Tie Down Pad	1
6	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.75 LG. Grade 5	2
7	●	Hex Head Cap Screw, 3/8 - 16 UNC - 3.25 LG. Grade 5	2
8	031326-05	Lift Eye Weldment	1
9	031393-02	Support Arm (right hand side)	1
10	●	Prevailing Torque Hex Nut, 1/4 All Metal Type	4
11	●	Plain Washer, 1/4 Regular Type B	8
12	●	Hex Head Cap Screw, 1/4 - 20 UNC - 1.0 LG. Grade 5	4
13	031584	Control Box Assembly (See Control Box section for parts detail.)	1
14	031572	Control Box Mount Bracket	1
15	008422	Loop Clamp	1
16	●	Helical Spring Lock Washer, 3/8 Regular	2
17	●	Hex Nut, 3/8 - 16	2

KITS AND MARKERS

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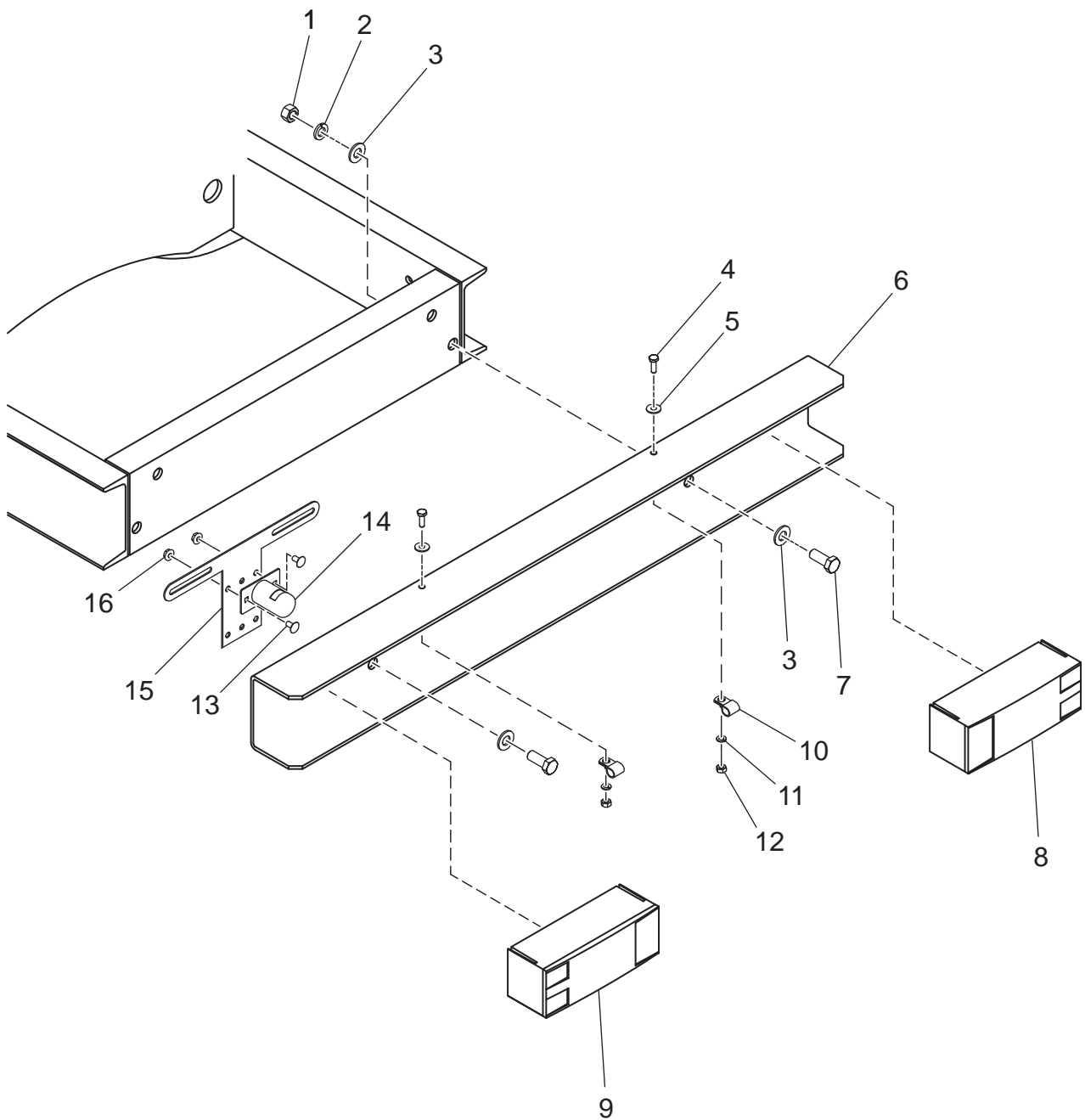


**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**

CONTROL BOX

Ref. No.	Part Number	Description	No. Req'd
1	031584	Control Box Assembly	1
2	031520	Controller/Display	1
3	031507	SPDT Rocker Switch	1
4	020886	Horn Button	1
5	031506	Ignition Switch	1
	031506-01	Replacement Key for Ignition Switch	2
6	031583	Control Box, Modified	1
7	031571	Control Box Back Panel	1
8	031585	Control Box Decal	1
9	031575	Mini ATM Fuse Block	1
10	031576	Mini ATM Fuse, 15A [Blue]	1
11	031577	Mini ATM Fuse, 20A [Yellow]	1
12	031578	Micro ISO Relay, 12V, SPDT	1
13	031568	Control Box Wire Harness (not shown)	1

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BUMPER ASSEMBLY

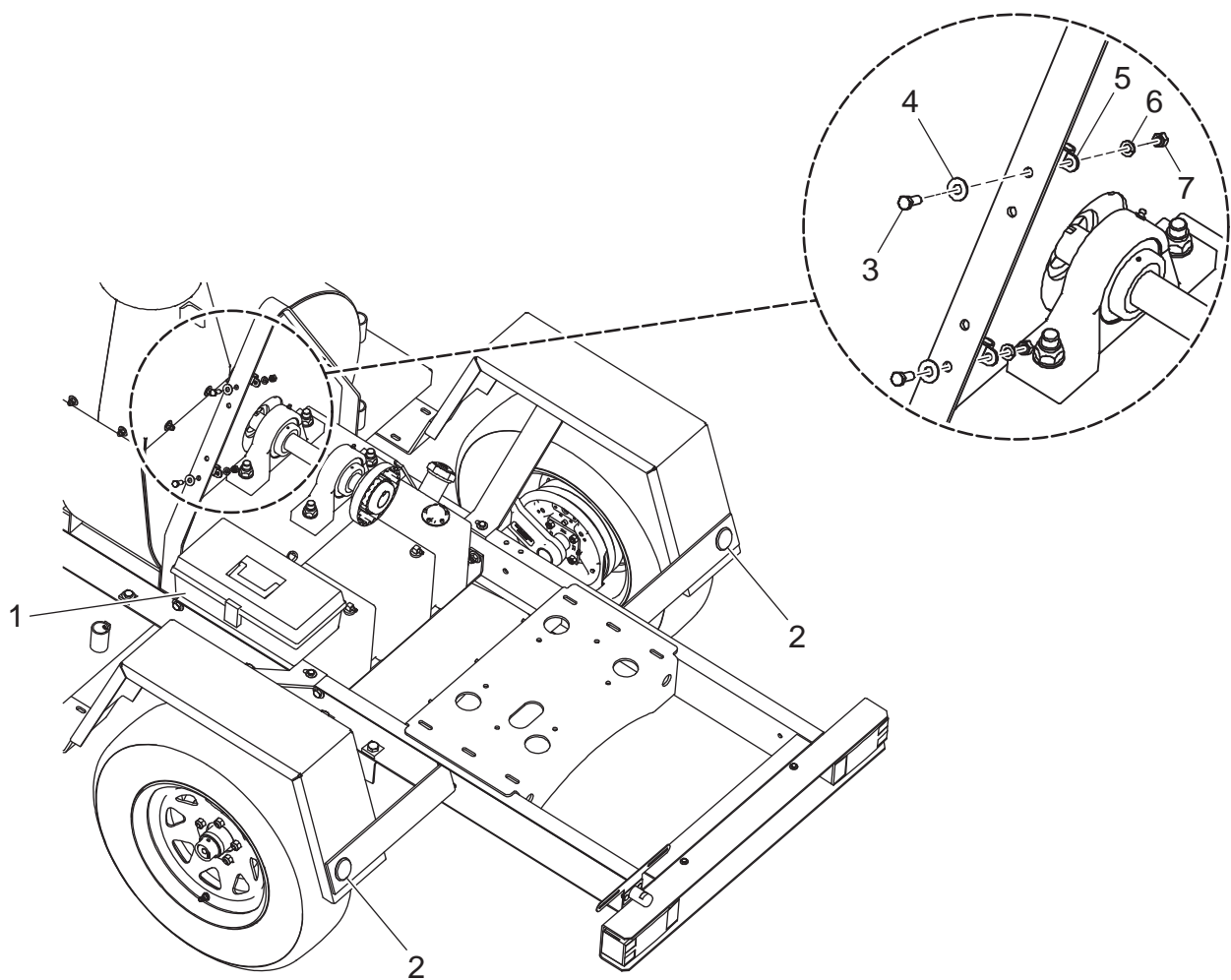
(STANDARD TRAILER MODELS)

Ref. No.	Part Number	Description	No. Req'd
1	●	Hex Nut, 1/2 - 13	2
2	●	Helical Spring Lock Washer, 1/2 Regular	2
3	●	Plain Washer, 1/2 Narrow Type A	4
4	●	Hex Head Cap Screw, 1/4 - 20 UNC - 0.75 LG. Grade 5	2
5	●	Plain Washer, 1/4 Regular Type B	2
6	031269	Bumper	1
7	●	Hex Head Cap Screw, 1/2 - 13 UNC - 1.25 LG. Grade 5	2
8	005138	7-way Taillight (right hand side)	1
9	005137	7-way Taillight (left hand side)	1
	005137-A	Taillight Lens	2
10	060281	Loop Clamp	2
11	●	Helical Spring Lock Washer, 1/4 Regular	2
12	●	Hex Nut, 1/4 - 20	2
13	●	Round Head Neck Bolt, 1/4 - 20 UNC - 0.5 LG. Grade 5	2
14	005436	License Plate Light	1
15	004720	License Plate Bracket	1
16	●	Hex Flange Nut, 10.25 - 20	2

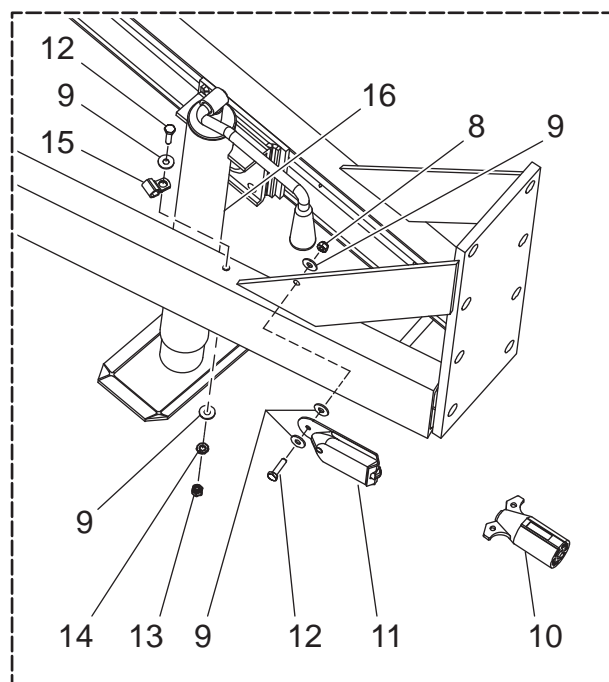
KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

**WHEN ORDERING PARTS, BE SURE TO STATE
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FRONT/JACK AREA



**WHEN ORDERING PARTS, BE SURE TO STATE
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HARDWARE ASSEMBLIES FOR ELECTRICAL COMPONENTS

(STANDARD TRAILER MODELS)

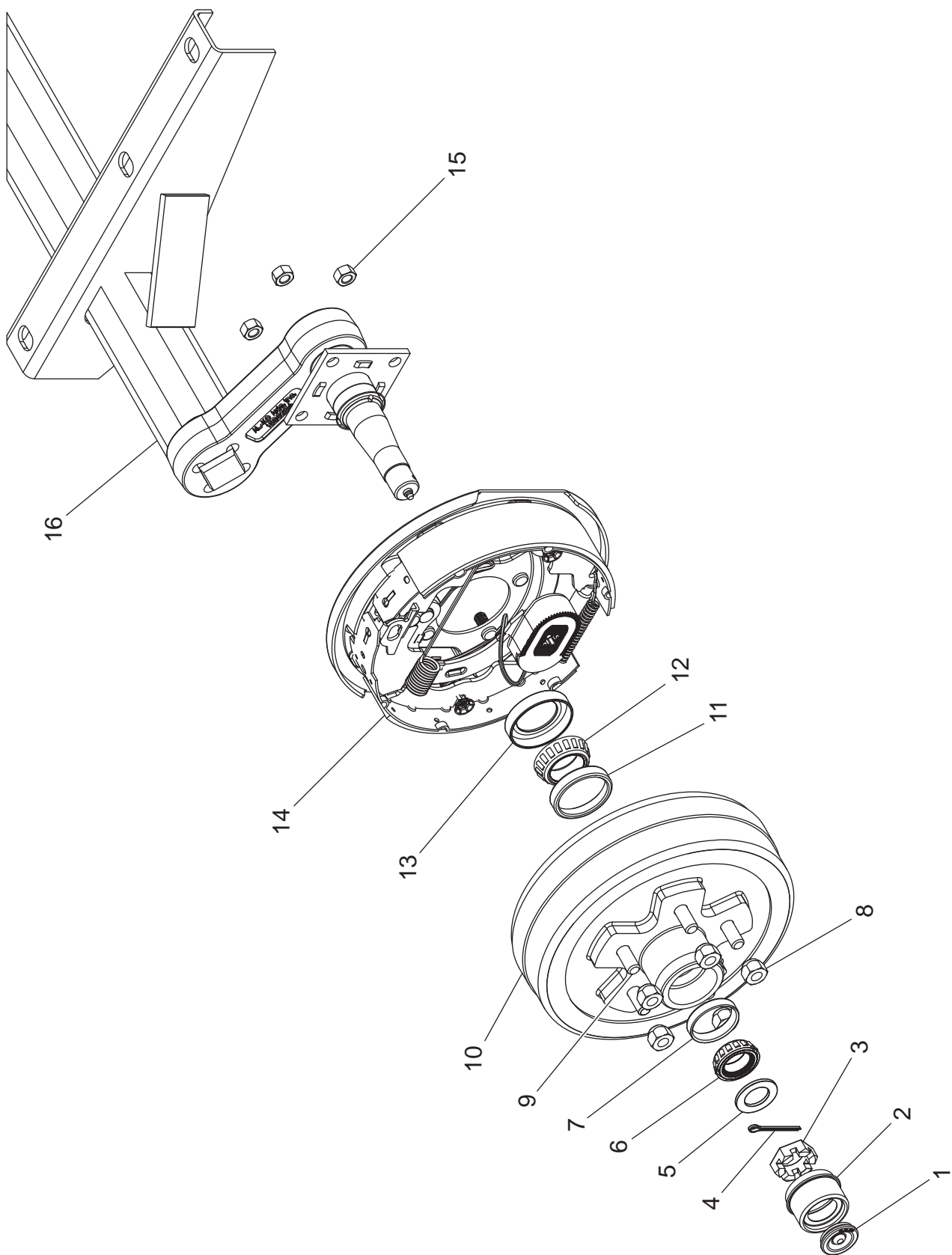
Ref. No.	Part Number	Description	No. Req'd
1	031389	Tool Box	1
2	004719	Red Reflector	2
3	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.0 LG. Grade 5	2
4	●	Plain Washer, 3/8 Regular Type B	2
5	008422	Loop Clamp	2
6	●	Helical Spring Lock Washer, 3/8 Regular	2
7	●	Hex Nut, 3/8 - 16	2
8	●	Prevailing Torque Hex Nut, 1/4 All Metal Type	1
9	●	Plain Washer, 1/4 Regular Type B	5
10	075592	7-Blade RV Style Trailer Plug	1
11	023424	Breakaway Switch	1
12	●	Hex Head Cap Screw, 1/4 - 20 UNC - 1.0 LG. Grade 5	2
13	●	Hex Nut, 1/4 - 20	1
14	●	Helical Spring Lock Washer, 1/4 Regular	1
15	060281	Loop Clamp	1
16	022588	Trailer Jack	1

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

NOTE: See Trailer Wiring section for wiring detail.

**WHEN ORDERING PARTS, BE SURE TO STATE
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**WHEN ORDERING PARTS, BE SURE TO STATE
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TRAILER WHEEL/AXLE ASSEMBLY

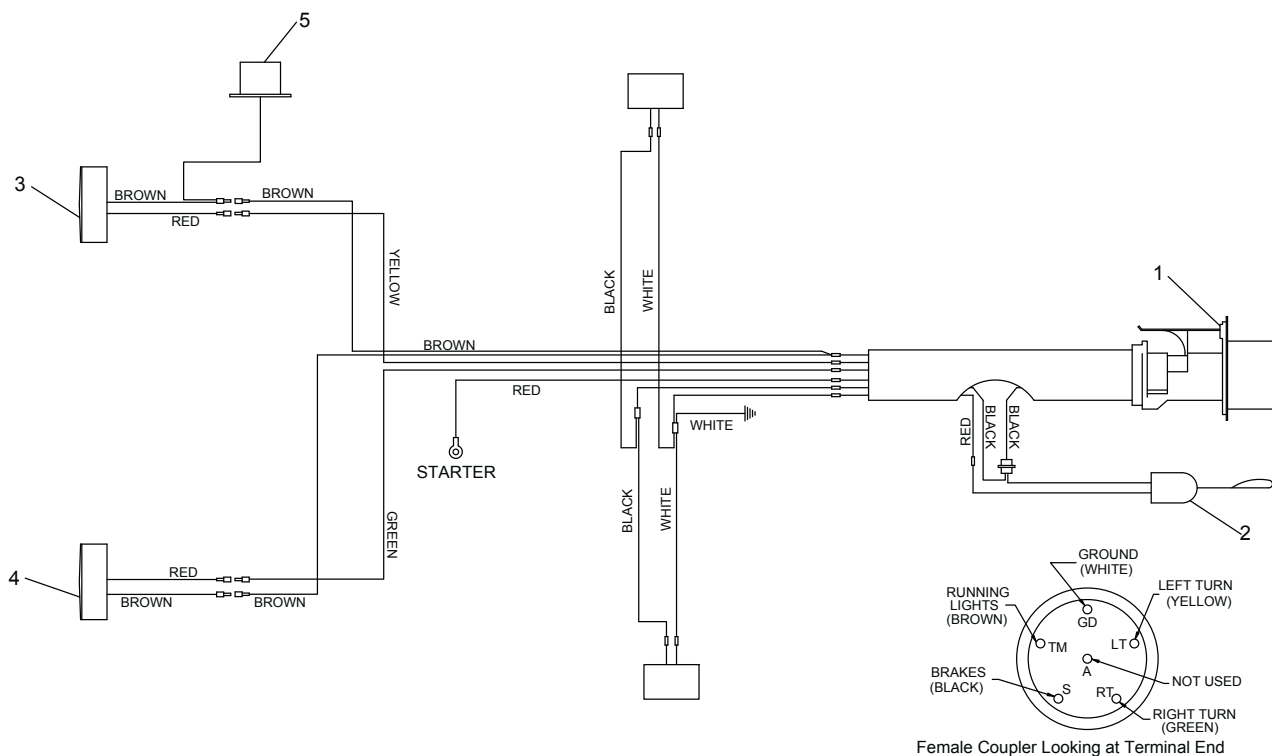
(STANDARD TRAILER MODELS)

Ref. No.	Part Number	Description	No. Req'd
1	005811-01	Rubber Plug Insert	1
2	005812-02	Grease Cap	1
3	005813-01	Spindle Nut	1
4	005814-01	Cotter Pin	1
5	005815-01	Spindle Washer	1
6 ♦	005816-02	Outer Bearing Cone	1
7 ♦	005817-02	Outer Bearing Race	1
8	005825-02	Wheel Lug Nut	5
9 ♦	005818-02	Wheel Stud	5
10	005819-02	Hub/Brake Drum Assembly	1
11 ♦	005820-02	Inner Bearing Race	1
12 ♦	005821-02	Inner Bearing Cone	1
13 ♦	005822-02	Grease Seal	1
14	005823-02	Brake Assembly, Left Side	1
	005824-02	Brake Assembly, Right Side	1
15	---	Hex Nut (included with part number 14)	4
16	031474	#3000 Rubber Torsion Axle B70 (includes all listed parts, Reference Numbers 1 - 16)	1
17	031475	Wheel/Tire Assembly (Not Shown)	2
	031512	Wheel	2
	031513	Tire	2

KITS AND MARKERS

- ♦ These items are available separately but are included with the Hub/Brake Drum Assembly (Reference Number 10).

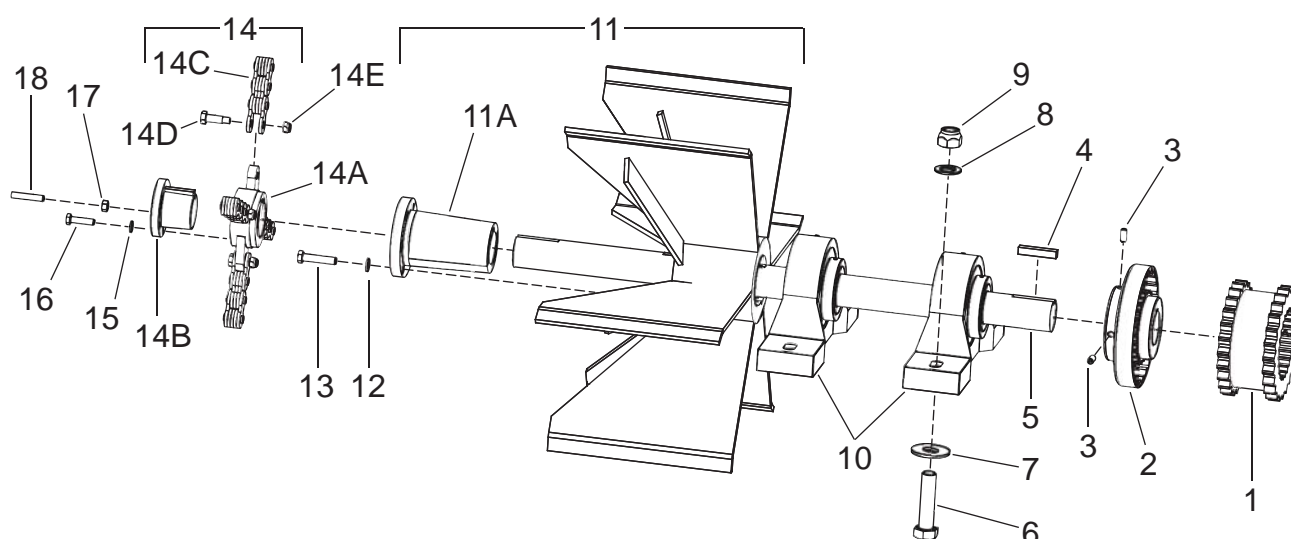
**WHEN ORDERING PARTS, BE SURE TO STATE
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TRAILER WIRING

Ref. No.	Part Number	Description	No. Req'd
	031210	Trailer Wiring Harness	1
1	075592	Trailer Plug	1
2	023424	Breakaway Switch	1
3	005138	Right Tail Light	1
4	005137	Left Tail Light	1
	005137-A	Lens	1
5	005436	License Light	1
	004720	License Plate Bracket	1

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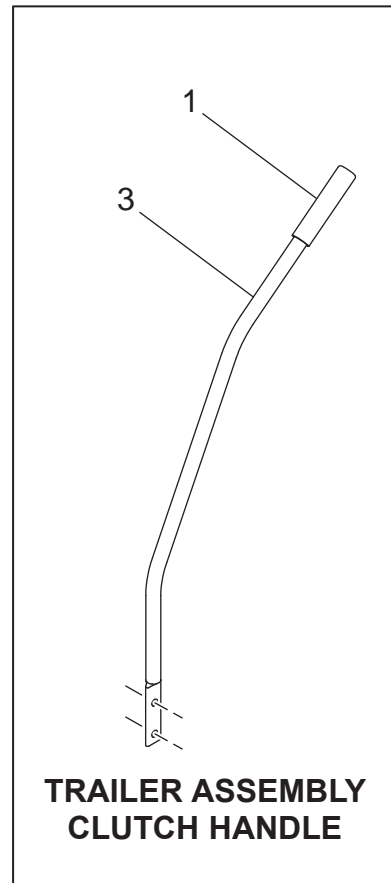
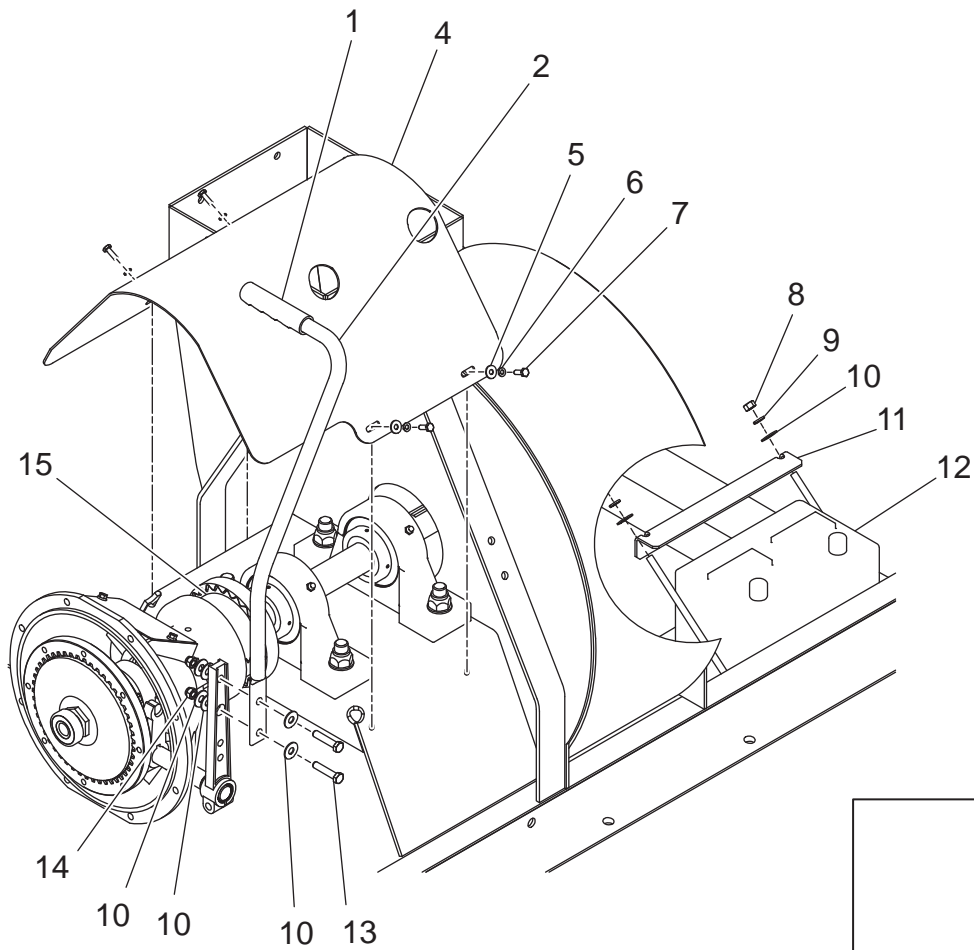
BLOWER AND DRIVE

Ref. No.	Part Number	Description	No. Req'd
1	031274	Coupling Insert	1
2	031272	Coupling Flange	1
3	●	Hex Socket Set Screw, Cup Point, 5/16 - 18 x 0.7	2
4	190125	Key, 3/8 x 3/8 x 2	1
5	030904	Blower Shaft	1
6	●	Hex Head Cap Screw, 3/4 - 10 UNC - 3 LG. Grade 5	4
7	●	Plain Washer, 3/4 Wide Type A	4
8	●	Plain Washer, 3/4 Narrow Type B	4
9	●	Prevailing Torque Hex Nut, 3/4 All Metal Type	4
10	030712	Bearing, Pillow Block	2
11	031029	Blower Blade with Hub	1
11A	030877	Blower Bushing	1
	●	Key, 3/8 x 3/8 x 4 (Bushing to Shaft, Not Shown)	1
	●	Key, 1/2 x 3/8 x 3 (Hub to Bushing, Not Shown)	1
12	●	Regular Helical Spring Lock Washer, 3/8	3
13	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.75 LG. Grade 5	3
14	030950	Beater Roll Assembly	1
14A	030872	Beater Roll Hub	1
14B	030876	Beater Roll Bushing	1
14C	020111	Beater Chain 3-Pitch	4
14D	020119	Beater Bolt	4
14E	022487	Flex Nut	4
15	●	Regular Helical Spring Lock Washer, 5/16	3
16	●	Hex Head Cap Screw, 5/16 - 18 UNC - 1.25 LG. Grade 5	3
17	●	Hex Nut, 5/16 UNC	1
18	●	Hex Head Cap Screw, 5/16 - 18 UNC - 1.75 LG. Grade 5 (Head Removed)	1

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

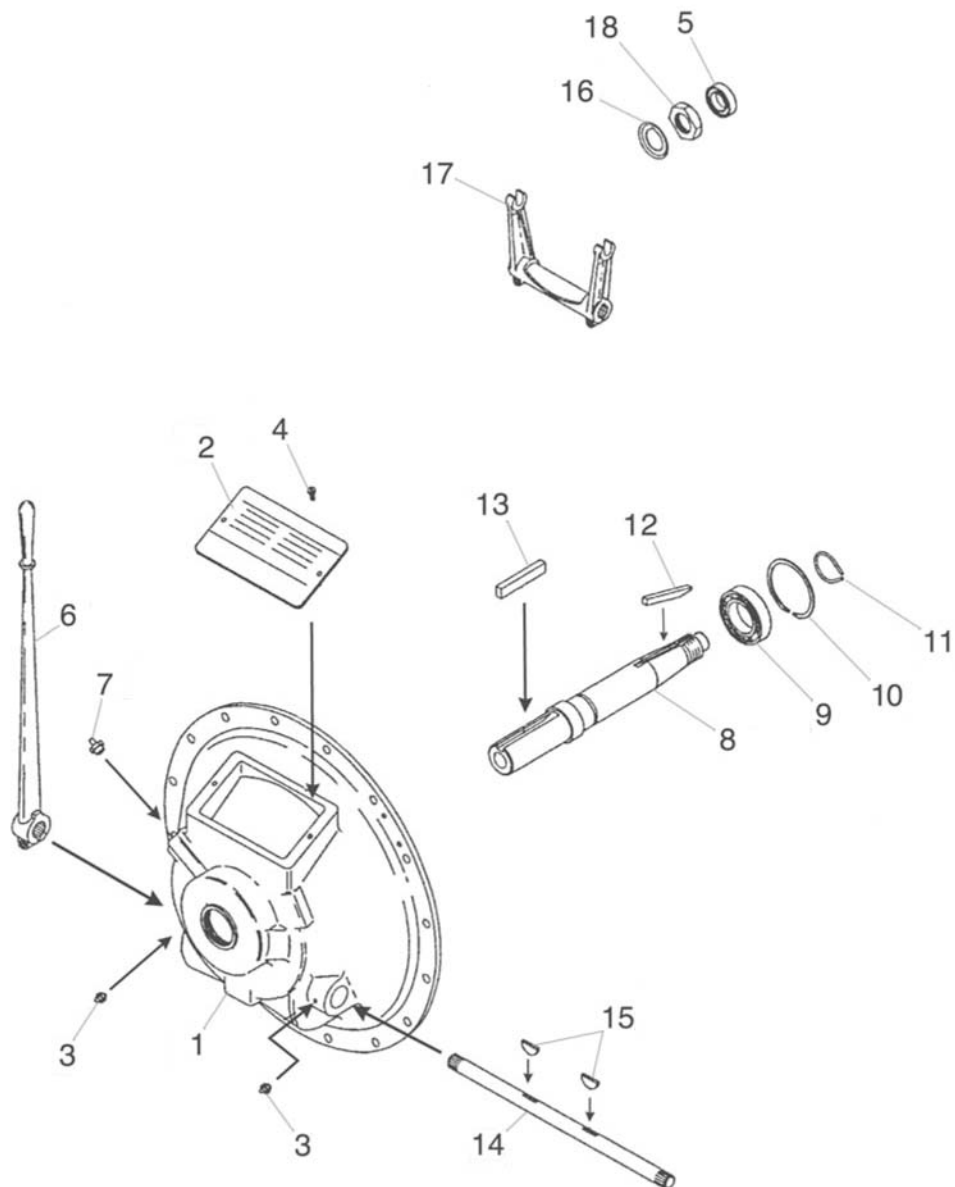
**WHEN ORDERING PARTS, BE SURE TO STATE
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COUPLING GUARD, CLUTCH HANDLE AND BATTERY ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	000427	Handle Grip, Black	1
2	031302	Clutch Lever (Skid and Right-hand Feed Models)	1
3	031144	Clutch Lever (Trailer Models Only)	1
4	031514	Coupling Guard	1
5	●	Plain Washer, 1/4 Regular Type B	4
6	●	Helical Spring Lock Washer, 1/4 Regular	4
7	●	Hex Head Cap Screw, 1/4 - 20 UNC - 0.75 LG. Grade 5	4
8	●	Hex Nut, 3/8 - 16	2
9	●	Helical Spring Lock Washer, 3/8 Regular	2
10	●	Plain Washer, 3/8 Regular Type B	8
11	031368	Battery Holddown Strap	1
12	002256-12	Battery	1
13	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.75 LG. Grade 5	2
14	●	Prevailing Torque Hex Nut, 3/8 All Metal Type	2
15	031274	Split Coupling Insert	1
●	Standard Hardware Item - Available at your local hardware store.		

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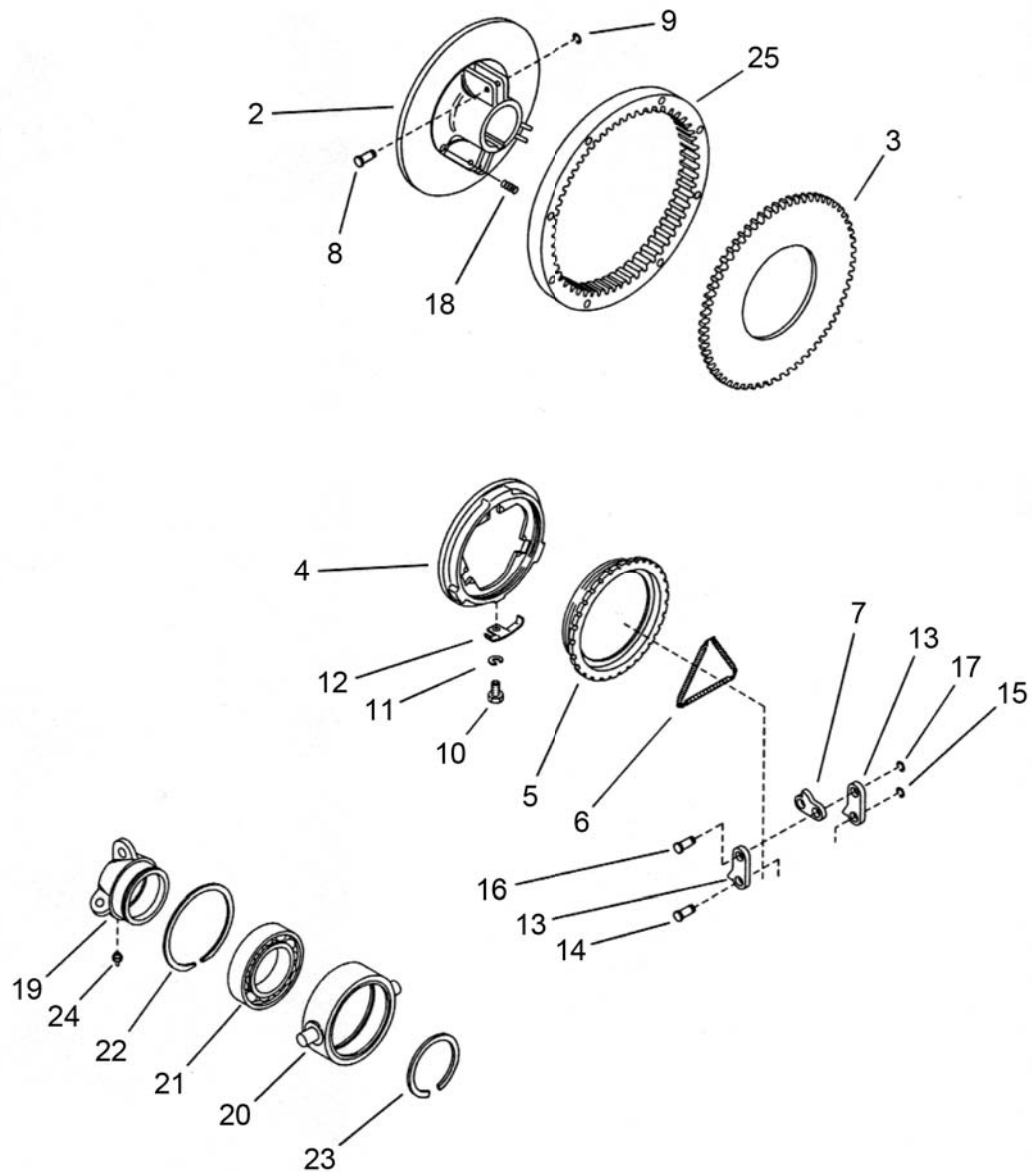


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POWER TAKE OFF ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
	031546	PTO Assembly	1
1	-----	Bell Housing	1
2	100348	Nameplate	1
3	100224	Grease Fitting (Cross Shaft)	2
4		Bolt	2
5	005151	Pilot Bearing	1
6	031219	Modified Clutch Lever	1
7	100043	Grease Fitting (Main Bearing)	1
8	100223	Drive Shaft	1
9	100060	Main Bearing	1
10	100059	Internal Snapping	1
11	100055	External Snapping	1
12	100056	Clutch Key	1
13	190125-32	Output Key	1
14	100041	Cross Shaft	1
15	100042	Woodruff Key	2
16	100047	Locking Washer	1
17	100073	Yoke Sub Assembly	1
18	100045	Locking Nut	1
KITS AND MARKERS			
	005432	Total Clutch Assembly (Includes Part 100333 (Clutch Assembly), Part 100218 (Drive Ring) and Key Numbers 6, 12, 14 through 18 this page)	1

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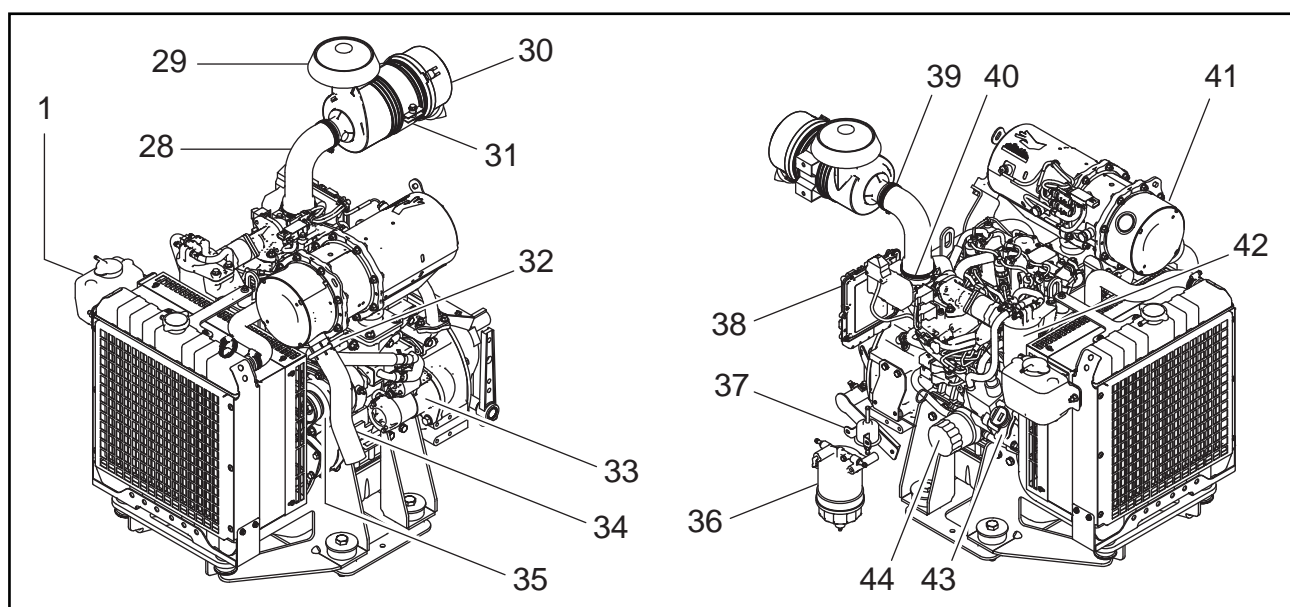
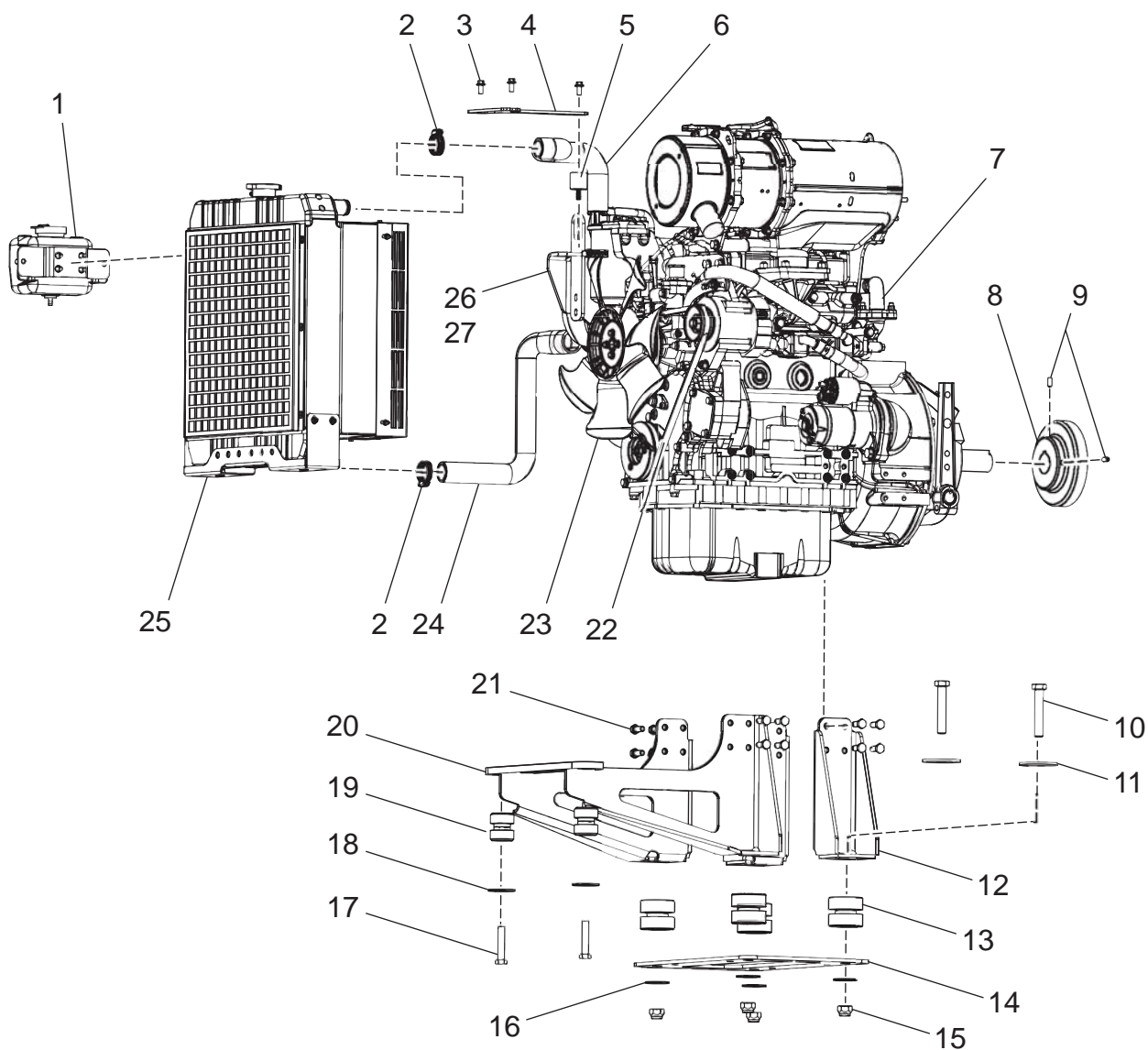
**WHEN ORDERING PARTS, BE SURE TO STATE
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CLUTCH ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	100333	Clutch Assembly (Includes Key Numbers 2 through 24)	1
2	X	Clutch Body	1
3	100209	Facing Plate	1
4	X	Pressure Plate	1
5	X	Adjusting Ring	1
5A	X	Wear Plate for Adjusting Ring (not shown)	1
6	100211	Lever Spring	1
7	X	Lever	3
8	X	Clevis Pin	3
9	X	Retaining Ring	3
10	X	Lock Bolt	1
11	X	Lock Washer	1
12	100214	Adjustment Lock	1
13	X	Link	6
14	X	Clevis Pin	3
15	X	Retaining Ring	3
16	X	Clevis Pin	3
17	X	Retaining Ring	3
18	X	Separator Spring	3
19	X	Release Sleeve	1
20	X	Bearing Carrier	1
21	X	Release Bearing	1
22	X	Internal Snapring	1
23	X	External Snapring	1
24	X	Grease Fitting	1
25	100218	Drive Ring	1
NOT SHOWN			
	100045	Locking Nut (See Power Take Off Assembly section for reference.)	1
	100047	Locking Washer (See Power Take Off Assembly section for reference.)	1

NOTE: Items with Part Number listed as "X" are only available as part of assemblies listed.

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ENGINE PARTS

Ref. No.	Kit Ref.	Part Number	Description	No. Req'd
1	▲	031542	Overflow Bottle Assembly, 1 quart	1
2	▲	●	Hose Clamp, 24 - 44 mm	4
3	■	●	Hex Flange Machine Screw, M8 - 16 x 1.25 LG	3
4	■	031534	Radiator Support, Upper	1
5	■	031538	Radiator Mount Isolator, Upper	1
6	▲	031544	Upper Radiator Hose	1
7		031504	Yanmar 3TNV88C-DYEM Engine	
8		031273	Coupling Flange	1
9		●	Hexagonal Socket Set Screw, 5/16 - 18 UNC x 0.7 LG	2
10		●	Hex Head Cap Screw, 5/8 - 11 UNC x 3.5 LG	4
11		005861	Washer	4
12		031502-01	Rear Engine Foot	2
13		005860-03	Engine Isolator	4
14		031503-01	Engine Mount Adapter Plate	1
15		●	Prevailing Torque Hex Nut, 3/8 All Metal Type	4
16		●	Plain Washer, 5/8 Regular Type B	4
17	■	●	Hex Head Cap Screw, 1/2 - 13 UNC x 2.5 LG	2
18	■	031537	Plain Washer	2
19	■	031539	Radiator Mount Isolator, Lower	2
20		31501-00	Front Engine Foot Weldment	2
21		●	Hex Head Cap Screw, M10 - 25 UNC x 1 LG	2
22		031562	V-Belt, Fan	1
23		031563	Cooling Fan	1
24	▲	031545	Lower Radiator Hose	1
25	▲	031541	Radiator Assembly	1
26	■	031535	Radiator Mount, Upper	1
27	■	031536	Radiator Mount Spacer, Upper	2
28		031548	Hose, Air Intake	1
29		031552	Rain Cap Assembly	1
30		031549	Air Cleaner Assembly with Air Filter Element	1
		031550	Air Filter Element	1
31		031551	Band, Air Cleaner	1
32		000461	Exhaust Clamp	1
33		031555	Starter	1
34		031488-01	Tailpipe Extension	1
35		031556	Alternator	1

Continued to next page.

**WHEN ORDERING PARTS, BE SURE TO STATE
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ENGINE PARTS

Ref. No.	Kit Ref.	Part Number	Description	No. Req'd
36		031522-00	Fuel/Water Separator Assembly	1
		031522-02	O-ring	1
		031522-03	Filter Element	1
37		031521	Pump Assembly, Fuel Feed	1
38	-----		ECU (Supplied with Engine)	1
39		022450	Pipe Clamp	1
40		007391	Pipe Clamp	1
41		Reference	DPF Assembly (must be serviced by Yanmar)	1
	-----		DPF Case (must be serviced by Yanmar)	1
	-----		Soot Filter (must be serviced by Yanmar)	1
	-----		Silencer (must be serviced by Yanmar)	1
	-----		Gasket (must be serviced by Yanmar)	1
42		031564	Filter, Fuel Oil	1
43		031560	Oil Cooler Assembly	1
44		031561	Oil Filter	1

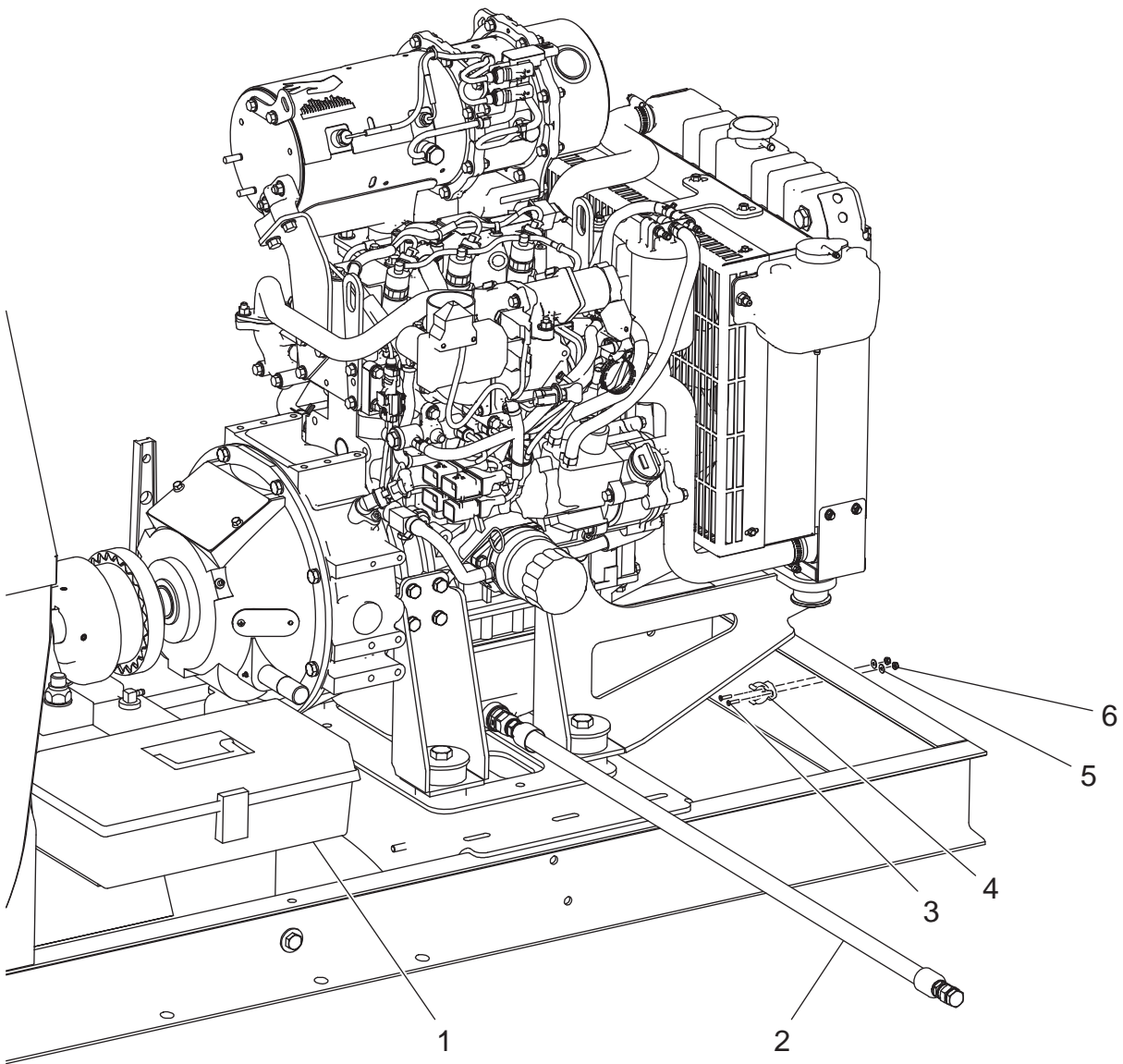
NOT SHOWN

		031557	Oil Fill Cap	1
		031559	Pilot Bearing Retainer	1
		031566	Switch, Oil Pressure	1
		031464	Fuel Tank Assembly	1
		031464-01	Fuel Tank	1
		031464-02	Drain Cock	1
		031464-03	Grommet	2
		031464-04	Fuel Tube Assembly	2
		005726	Fuel Cap	1
		031459	Fuel Level Gauge	1
		031197-03	Mounting Strap	2
		035024-09	Fuel Tank Spacer Blocks (Skid Units Only)	4

KITS AND MARKERS

- | | | |
|---|---|-----------------------|
| ▲ | 031540 | Complete Radiator Kit |
| ■ | 031533 | Radiator Bracket Kit |
| ● | Standard Hardware Item - Available at your local hardware store | |

**WHEN ORDERING PARTS, BE SURE TO STATE
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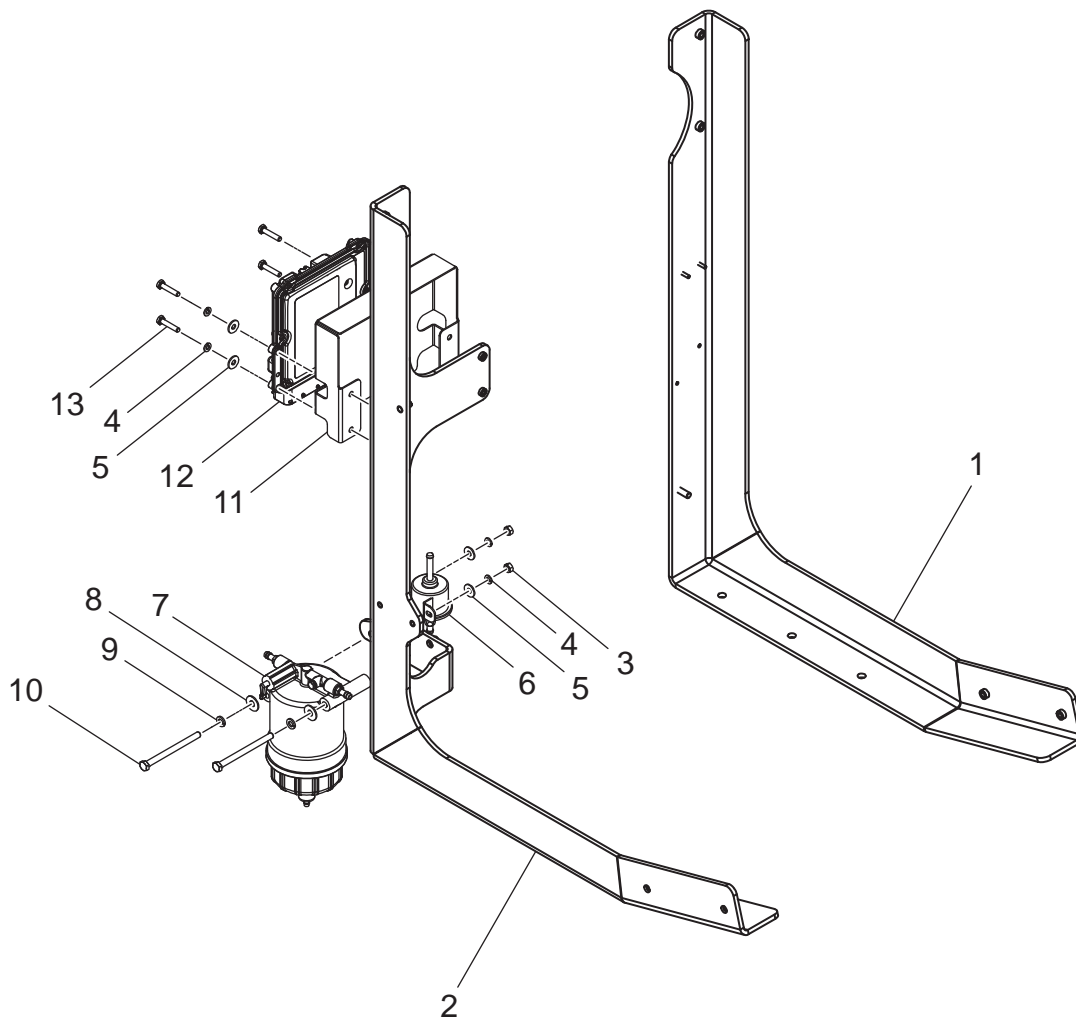
ENGINE OIL DRAIN

Ref. No.	Part Number	Description	No. Req'd
1	031389	Tool Box	1
2	031553	Hose Assembly, Remote Oil Drain (RH and Skid Units Only)	1
3	●	6 - 32 x 5/8 Flat Countersunk Head Machine Screw (RH and Skid Units Only)	2
4	031423	Spring Clip Holder (RH and Skid Units Only)	1
5	●	Plain Washer, #6 Regular Type B (RH and Skid Units Only)	2
6	●	Prevailing Torque Hex Nut, #6 All Metal Type (RH and Skid Units Only)	2

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

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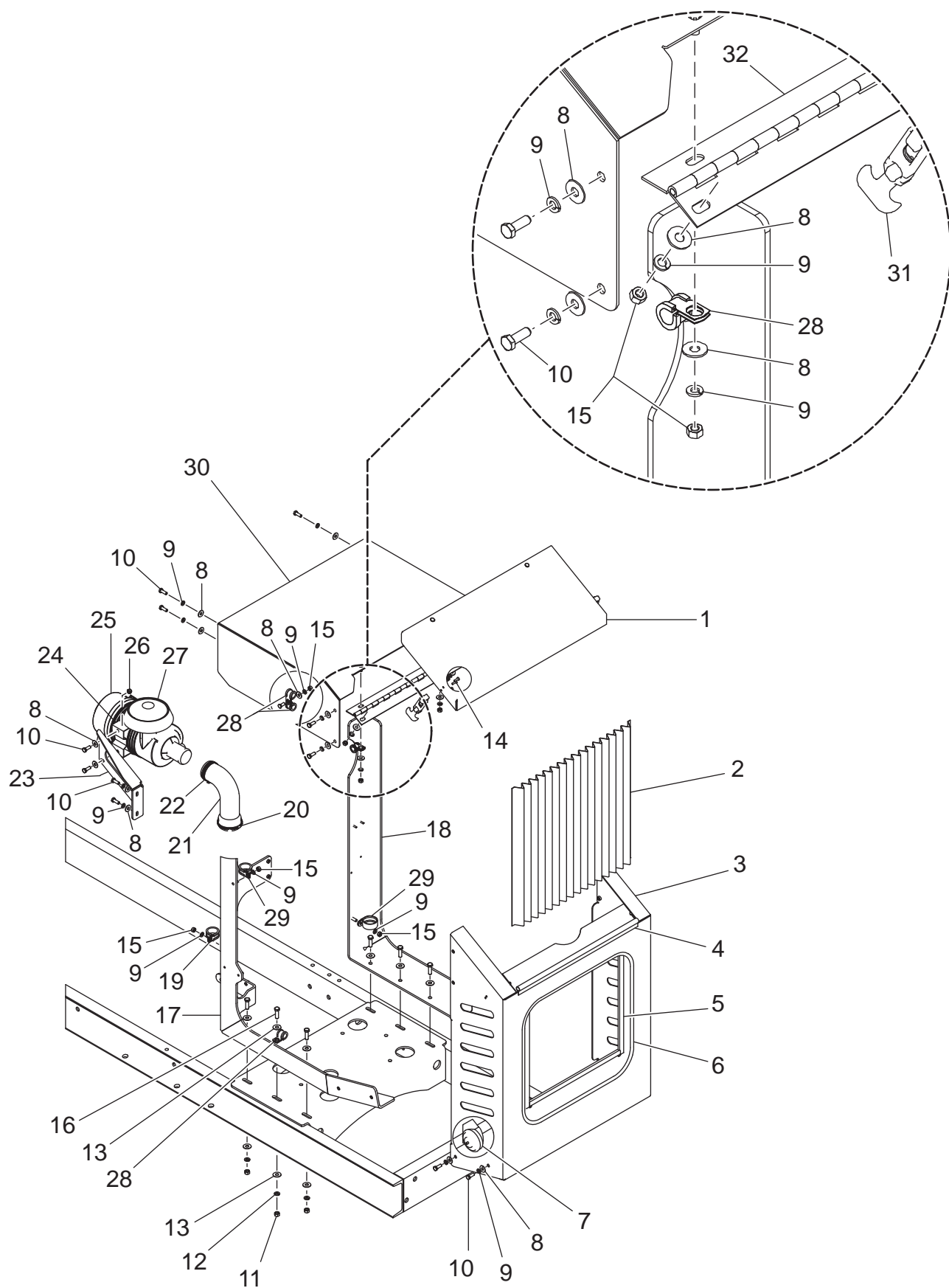
ENGINE PERIPHERAL ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	031482-00	Left Hand Engine Shroud Support Weldment	1
2	031483-00	Right Hand Engine Shroud Support Weldment	1
3	●	Hex Nut, 1/4 - 20	2
4	●	Helical Spring Lock Washer, 1/4 Regular	4
5	●	Plain Washer, 1/4 Regular Type B	4
6	031521	Pump Assembly, Fuel Feed	1
7	031522-00	Fuel/Water Separator Assembly	1
	031522-02	O-ring	1
	031522-03	Filter Element	1
8	●	Plain Washer, 5/16 Regular Type B	2
9	●	Helical Spring Lock Washer, 5/16 Regular	2
10	●	Hex Head Cap Screw, 5/16 - 18 UNC - 4.0 LG. Grade 5	8
11	031518-01	ECU Cover	1
12	031504	ECU (Supplied with Engine)	1
13	●	Hex Head Cap Screw, 1/4 - 20 UNC - 1.25 LG. Grade 5	1

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

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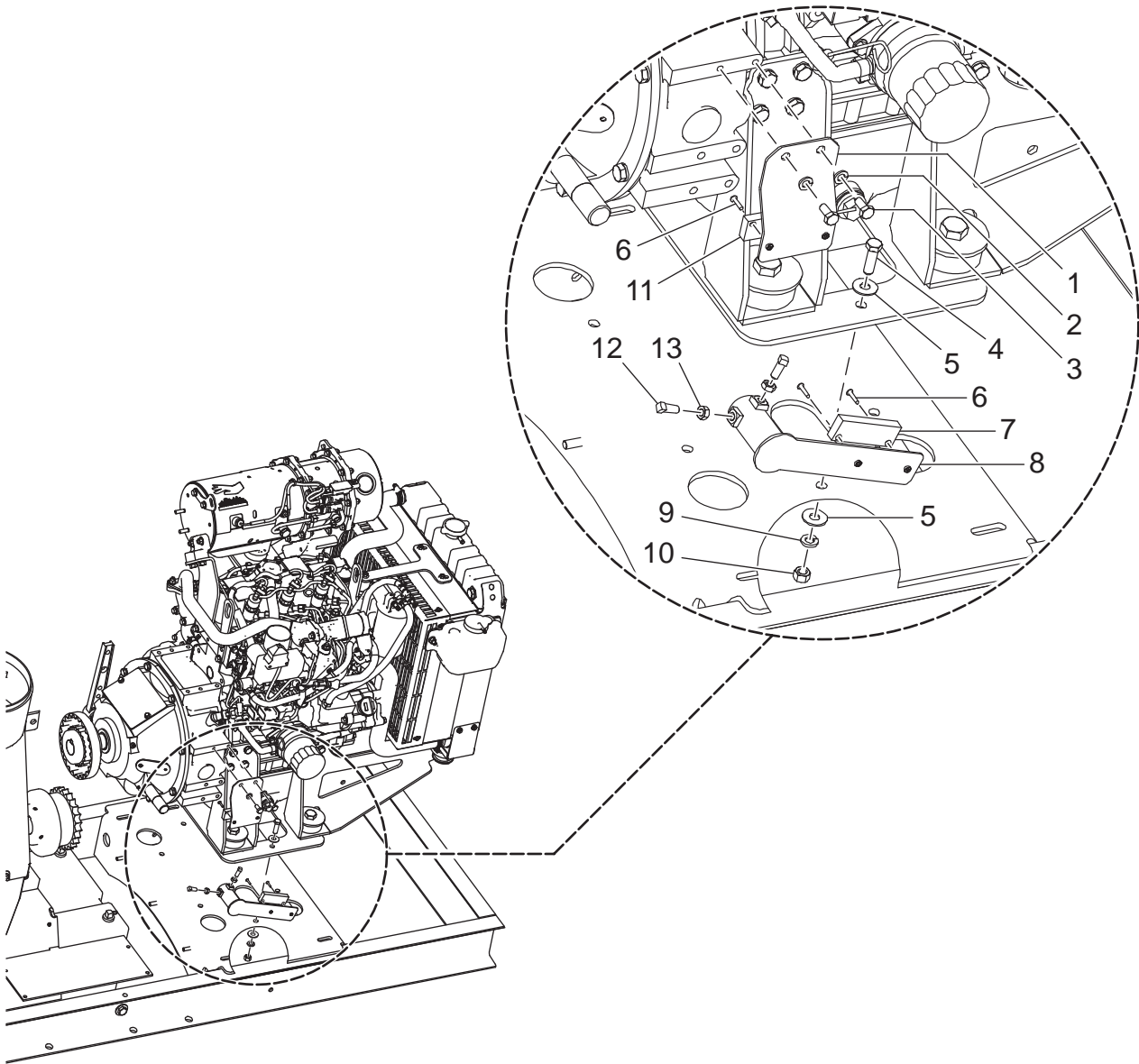
ENGINE SHEETMETAL ASSEMBLY

Ref. No.	Part Number	Description	No. Req'd
1	031485-00	Engine Shroud Access Door Assembly	1
2	031403	Radiator Screen	1
3	031487-00	Radiator Shroud Weldment	1
4	190260	Trim Seal, 5/8 Bulb x 1/8 Edge Thick	1
5	190259	Edge Trim, 7/16 Wide x 1/16 Edge Thick	1
6	190258	Trim Seal, 7/16 Bulb x 1/16 Edge Thick	4
7	006499	Horn Assembly	1
8	●	Plain Washer, 5/16 Regular Type B	18
9	●	Helical Spring Lock Washer, 5/16 Regular	24
10	●	Hex Head Cap Screw, 5/16 - 18 UNC - 0.875 LG. Grade 5	14
11	●	Hex Nut, 3/8 - 16	6
12	●	Helical Spring Lock Washer, 3/8 Regular	6
13	●	Plain Washer, 3/8 Regular Type B	12
14	●	Cross Recessed Pan Head Screw, #10 - 24 - 5/8	4
15	●	Hex Jam Nut, 5/16 - 18	4
16	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	6
17	031483-00	Right Hand Engine Shroud Support Weldment	1
18	031482-00	Left Hand Engine Shroud Support Weldment	1
19	005650	Cushioned Loop Clamp	1
20	007391	Clamp, 3 inch	1
21	031548	Air Intake Hose	1
22	022450	Clamp, 2-1/2 inch	1
23	031484-01	Air Cleaner Bracket	1
24	031551	Air Cleaner Band	1
25	031549	Air Cleaner Assembly with Filter Element	1
26	●	Prevailing Torque Hex Nut, 5/16 All Metal Type	2
27	031552	Rain Cap Assembly	1
28	031267	Cushioned Loop Clamp, 0.625 Diameter	2
29	013111	Cushioned Loop Clamp, 1.25 Diameter	2
30	031486-00	Engine Upper Shroud Assembly	1
31	023758	Flexible Draw Latch	2
32	031404-01	Engine Top Hinge	1

KITS AND MARKERS

- Standard Hardware Item - Available at your local hardware store.

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REGEN INTERLOCK SWITCH

Ref. No.	Part Number	Description	No. Req'd
1	031489-00	Regen Interlock Bracket	1
2	●	Helical Spring Lock Washer, M8	2
2	●	Hex Head Cap Screw, M8 x 1.25 - 16	2
4	●	Hex Head Cap Screw, 3/8 - 16 UNC - 1.25 LG. Grade 5	1
5	●	Plain Washer, 3/8 Regular Type B	2
6	●	Cross Recessed Pan Head Screw, #6 - 32 - 5/8	4
7	005893	Regen Interlock Switch Magnet	1
8	031519-00	Regen Interlock Actuator	1
9	●	Helical Spring Lock Washer, 3/8 Regular	4
10	●	Hex Nut, 3/8 - 16	1
11	031567-06	Regen Interlock Switch Cable Assembly	1
12	●	Square Head Set Screw, 5/16 - 18 - 0.75 LG.	2
13	●	Hex Jam Nut, 5/16 - 18	2

KITS AND MARKERS

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ELECTRICAL

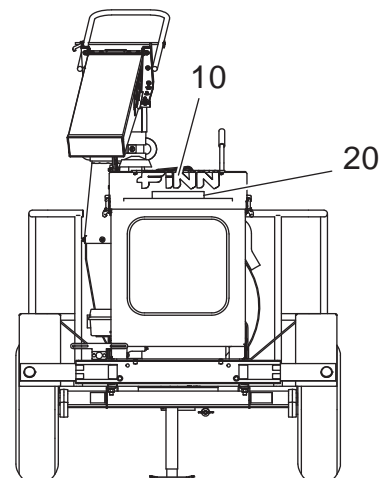
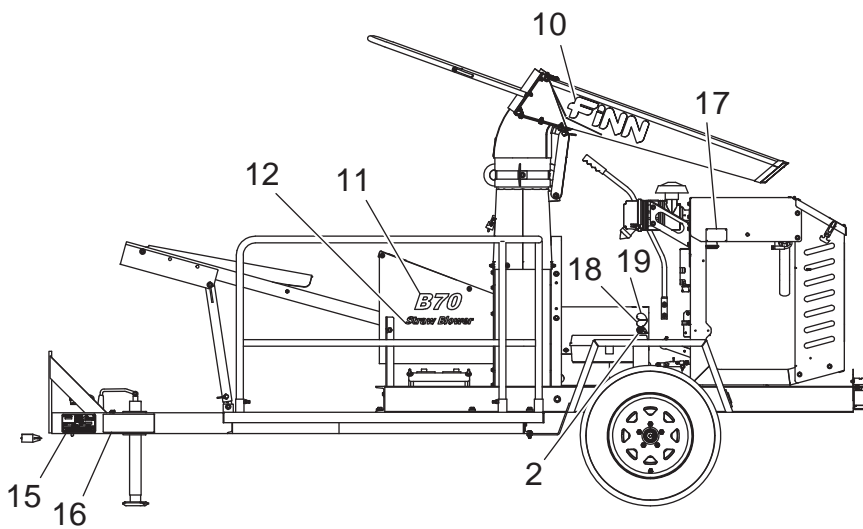
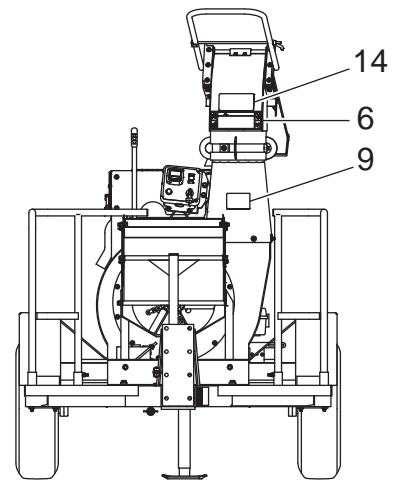
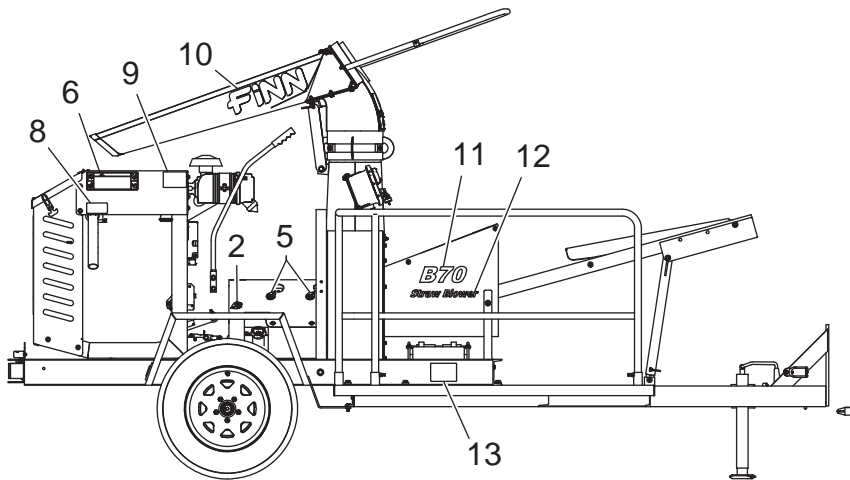
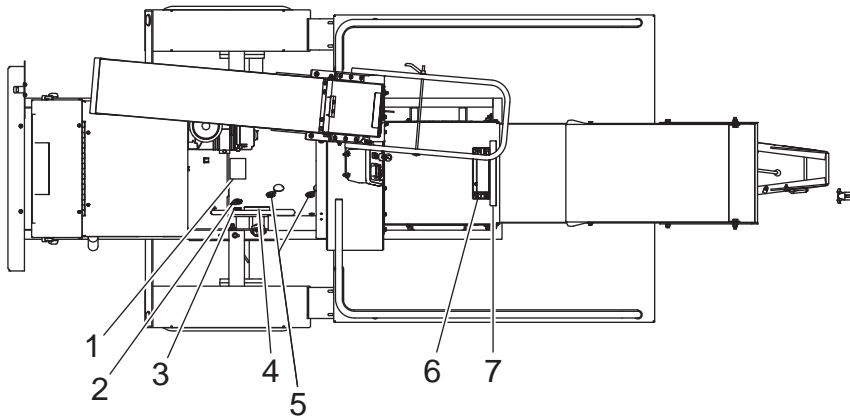
Ref. No.	Part Number	Description	No. Req'd
	031567-01	Engine Harness - Trailer Models	1
	031567-02	Engine Harness - Skid Models	1
	031567-03	Battery Ground Cable	1
	031567-04	Starter Cable	1
	031567-05	Frame Ground Cable	1
	031567-06	Regeneration Interlock Switch Cable Assembly	1
	085185	Positive Battery Lug	1
	085186	Negative Battery Lug	1
	085187	Positive Battery Boot	1
	085188	Negative Battery Boot	1

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TOOL KIT

Ref. No.	Part Number	Description	No. Req'd
	020057	#13 Twine Knife	1
	020063	#11 Twine Knife	1
		Manual, Engine	1
		Manual, Parts and Operation	1

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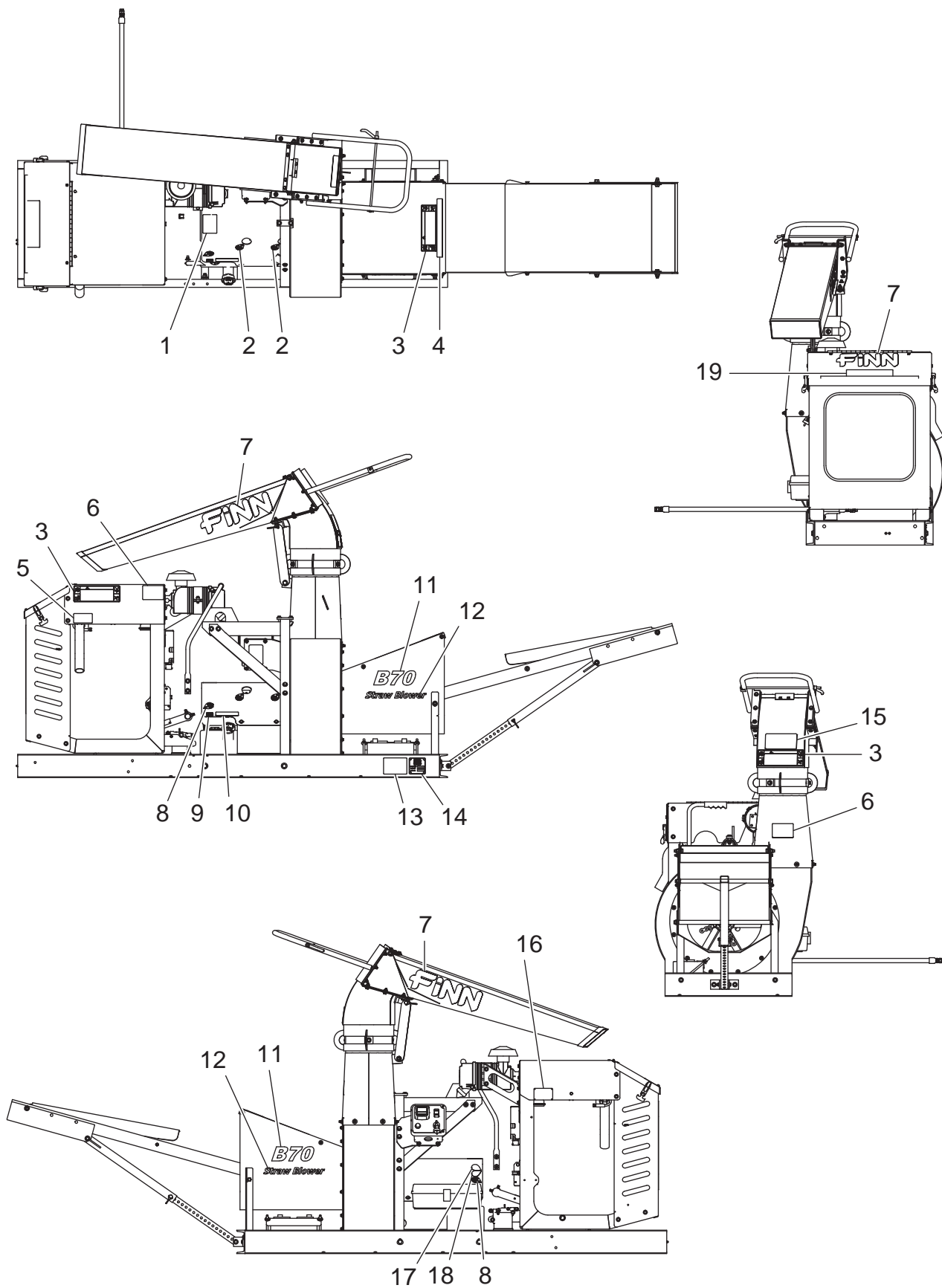
**WHEN ORDERING PARTS, BE SURE TO STATE
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B70 TRAILER DECALS

Ref. No.	Part Number	Description	No. Req'd
1	<input type="checkbox"/>	Decal "CLUTCH ADJUSTMENT"	1
2	<input type="checkbox"/>	Decal "Service Weekly"	3
3	031565	Label, FUEL OIL CAUTION	1
4	<input type="checkbox"/>	Decal "DIESEL FUEL ONLY"	1
5	<input type="checkbox"/>	Decal "Service Weekly"	2
6	<input type="checkbox"/>	Decal "Sever Hazard"	3
7	<input type="checkbox"/>	Decal "WEAR EYE PROTECTION"	1
8	<input type="checkbox"/>	Decal "WARNING BURN HAZARD"	1
9	<input type="checkbox"/>	Decal "CAUTION WEAR EAR PROTECTION"	2
10	031235	Decal Finn Medium Red	3
11	023856-02	Decal "B70"	2
12	023855	Decal "Strawblower"	2
13	<input type="checkbox"/>	Decal "PATENT NO."	1
14	<input type="checkbox"/>	Decal "CAUTION DO NOT RIDE"	1
15	031554	TRAILER NAMEPLATE BLANK, SINGLE AXLE	1
16	<input type="checkbox"/>	Decal "WARNING! RUNAWAY VEHICLE HAZARD"	1
17	012260	Metal Plate "Important"	1
18	<input type="checkbox"/>	Decal "SERVICE DAILY"	1
19	<input type="checkbox"/>	Decal "HANDGUN ONLY"	1
20	<input type="checkbox"/>	Decal "WARNING COOLING SYSTEM"	1
	<input type="checkbox"/>	031460 B70 Decal Kit	

NOTE: All of the decals listed here with a ☐ in the part number space are available only in the B70 Decal Kit. Replacement decals and plates for those identified with a part number are **not** part of the decal kit and **must** be ordered separately.

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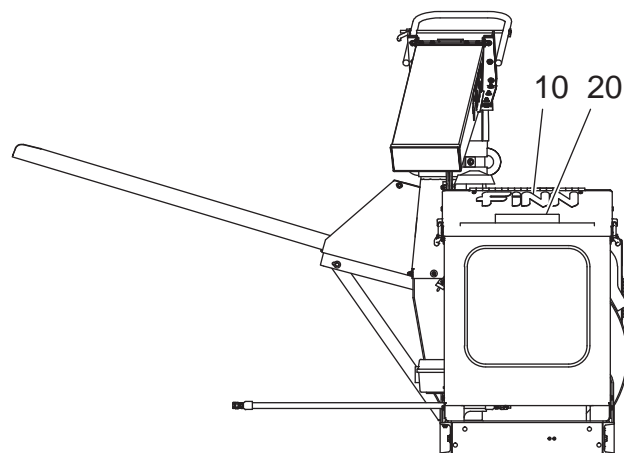
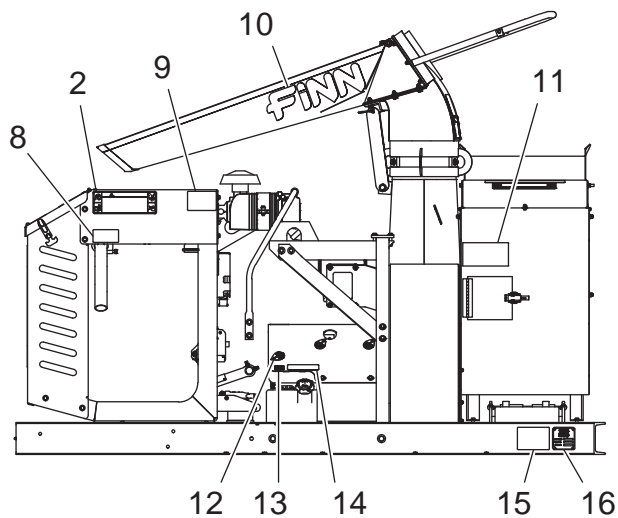
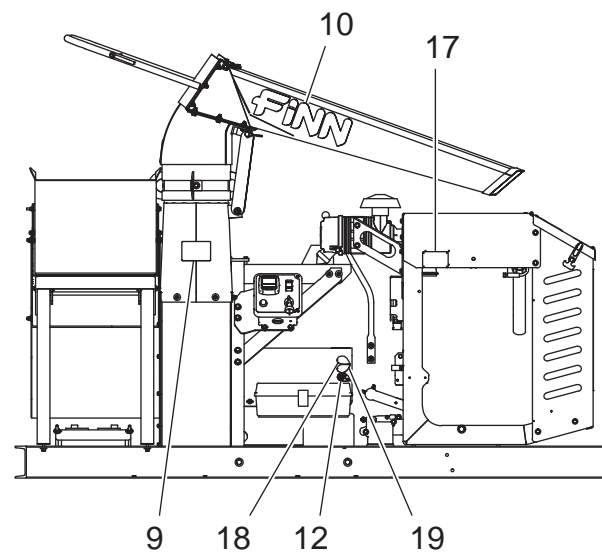
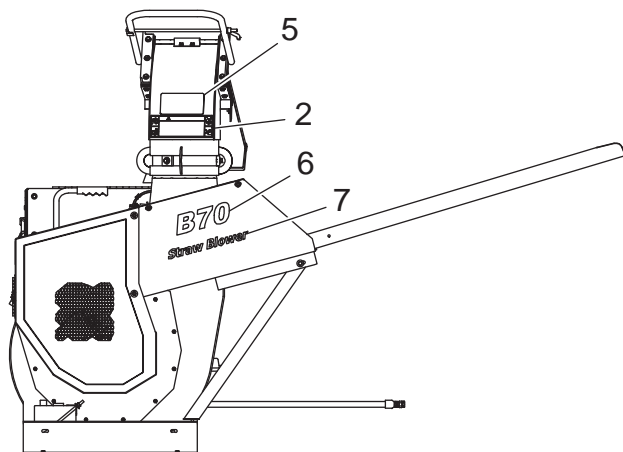
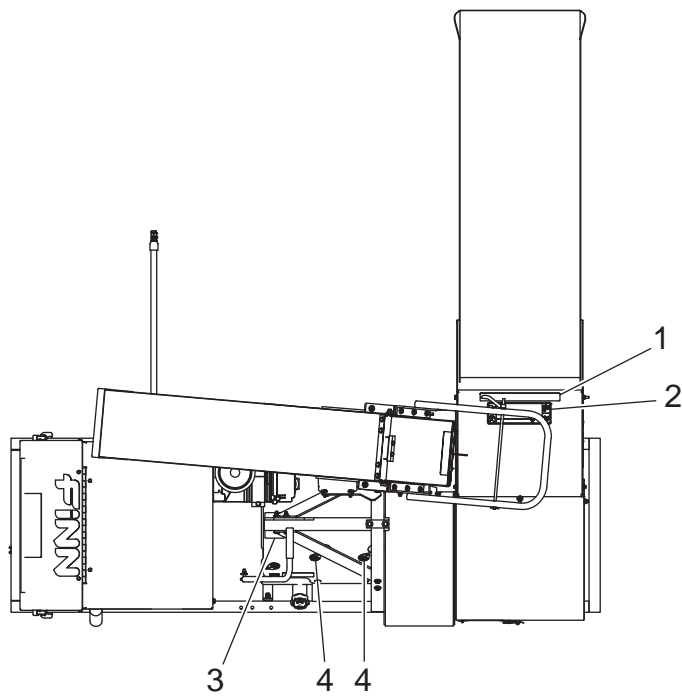
**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**

B70 SKID DECALS

Ref. No.	Part Number	Description	No. Req'd
1	<input type="checkbox"/>	Decal "CLUTCH ADJUSTMENT"	1
2	<input type="checkbox"/>	Decal "Service Weekly"	2
3	<input type="checkbox"/>	Decal "Sever Hazard"	3
4	<input type="checkbox"/>	Decal "WEAR EYE PROTECTION"	1
5	<input type="checkbox"/>	Decal "WARNING BURN HAZARD"	1
6	<input type="checkbox"/>	Decal "CAUTION WEAR EAR PROTECTION"	2
7	031235	Decal Finn Medium Red	3
8	<input type="checkbox"/>	Decal "Service Weekly"	2
9	031565	Label, FUEL OIL CAUTION	1
10	<input type="checkbox"/>	Decal "DIESEL FUEL ONLY"	1
11	023856-02	Decal "B70"	2
12	023855	Decal "Strawblower"	2
13	<input type="checkbox"/>	Decal "PATENT NO."	1
14	031569	SKID NAMEPLATE BLANK	1
15	<input type="checkbox"/>	Decal "CAUTION DO NOT RIDE"	1
16	012260	Metal Plate "Important"	1
17	<input type="checkbox"/>	Decal "HANDGUN ONLY"	1
18	<input type="checkbox"/>	Decal "SERVICE DAILY"	1
19	<input type="checkbox"/>	Decal "WARNING COOLING SYSTEM"	1
<input type="checkbox"/>	031460	B70 Decal Kit	

NOTE: All of the decals listed here with a ☐ in the part number space are available only in the B70 Decal Kit. Replacement decals and plates for those identified with a part number are **not** part of the decal kit and **must** be ordered separately.

**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**



**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**

B70 RIGHT HAND DECALS

Ref. No.	Part Number	Description	No. Req'd
1	<input type="checkbox"/>	Decal "WEAR EYE PROTECTION"	1
2	<input type="checkbox"/>	Decal "Sever Hazard"	3
3	<input type="checkbox"/>	Decal "CLUTCH ADJUSTMENT"	1
4	<input type="checkbox"/>	Decal "Service Weekly"	2
5	<input type="checkbox"/>	Decal "CAUTION DO NOT RIDE"	1
6	023856-02	Decal "B70"	1
7	023855	Decal "Strawblower"	1
8	<input type="checkbox"/>	Decal "WARNING BURN HAZARD"	1
9	<input type="checkbox"/>	Decal "CAUTION WEAR EAR PROTECTION"	2
10	031235	Decal Finn Medium Red	3
11	<input type="checkbox"/>	Decal "DANGER DO NOT OPEN DOOR"	1
12	<input type="checkbox"/>	Decal "Service Weekly"	2
13	031565	Label, FUEL OIL CAUTION	1
14	<input type="checkbox"/>	Decal "DIESEL FUEL ONLY"	1
15	<input type="checkbox"/>	Decal "PATENT NO."	1
16	031569	SKID NAMEPLATE BLANK	1
17	012260	Metal Plate "Important"	1
18	<input type="checkbox"/>	Decal "HANDGUN ONLY"	1
19	<input type="checkbox"/>	Decal "SERVICE DAILY"	1
20	<input type="checkbox"/>	Decal "WARNING COOLING SYSTEM"	1
	<input type="checkbox"/>	031460 B70 Decal Kit	

NOTE: All of the decals listed here with a ☐ in the part number space are available only in the B70 Decal Kit. Replacement decals and plates for those identified with a part number are **not** part of the decal kit and **must** be ordered separately.

**WHEN ORDERING PARTS, BE SURE TO STATE
SERIAL NUMBER OF MACHINE**