

OPERATION AND PARTS MANUAL



Electric and Gasoline Floor Planers Model 8FP Series

Revision #2 (05/28/09)

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www.multiquip.com



THIS MANUAL MUST ACCOMPANY THE EQUIPMENT AT ALL TIMES



WARNING



CALIFORNIA — Proposition 65 Warning

Engine exhaust and some of its constituents, and some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks.
- Cement and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: **ALWAYS** work in a well ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

MULTIQUIP FLOOR PLANERS 8FP SERIES

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PARTS ORDERING PROCEDURES

Ordering parts has never been easier! Choose from three easy options:

Effective:
January 1st, 2006



Order via Internet (Dealers Only):

Order parts on-line using Multiquip's SmartEquip website!

- View Parts Diagrams
- Order Parts
- Print Specification Information



If you have an MQ Account, to obtain a Username and Password, E-mail us at: parts@multiquip.com.

To obtain an MQ Account, contact your District Sales Manager for more information.

Goto www.multiquip.com and click on **Order Parts** to log in and save!

Use the **internet** and qualify for a **5% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Fax (Dealers Only):

All customers are welcome to order parts via Fax.

Domestic (US) Customers dial:
1-800-6-PARTS-7 (800-672-7877)

Fax your order in and qualify for a **2% Discount** on *Standard orders* for all orders which include complete part numbers.*

Note: Discounts Are Subject To Change



Order via Phone: Domestic (US) Dealers Call:
1-800-427-1244

Non-Dealer Customers:

Contact your local Multiquip Dealer for parts or call 800-427-1244 for help in locating a dealer near you.



International Customers should contact their local Multiquip Representatives for Parts Ordering information.

When ordering parts, please supply:

- | | |
|---|--|
| <input type="checkbox"/> Dealer Account Number | <input type="checkbox"/> Specify Preferred Method of Shipment: |
| <input type="checkbox"/> Dealer Name and Address | <input checked="" type="checkbox"/> UPS/Fed Ex <input checked="" type="checkbox"/> DHL |
| <input type="checkbox"/> Shipping Address (if different than billing address) | <input type="checkbox"/> Priority One <input checked="" type="checkbox"/> Truck |
| <input type="checkbox"/> Return Fax Number | <input type="checkbox"/> Ground |
| <input type="checkbox"/> Applicable Model Number | <input type="checkbox"/> Next Day |
| <input type="checkbox"/> Quantity, Part Number and Description of Each Part | <input type="checkbox"/> Second/Third Day |

NOTICE

All orders are treated as *Standard Orders* and will ship the same day if received prior to 3PM PST.

WE ACCEPT ALL MAJOR CREDIT CARDS!



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NOTICE TO OPERATORS

IF YOU CAN NOT READ OR DO NOT FULLY UNDERSTAND THE CONTENTS OF THIS MANUAL, PLEASE CONTACT THE FACTORY FOR PROPER ASSISTANCE BEFORE ATTEMPTING TO OPERATE THIS PRODUCT.

SI TU NO PUEDES LE'ER O NO COMPRENDES EL CONTENIDO DE ESTE MANUAL FAVOR DE PONERSE EN CONTACTO CON LA. FABRICA PARA ASISTENCIA- A PROPIA ANTES DE INTENTAR PARA OPERAR ESTE PRODUCTO.

SOLLTEN SIE DIESE GEBRAUCHSANWEISUNG NICHT LESEN KOENNEN ODER ES NICHT VOLLKOMMEN VERSTEHEN, WENDEN SIE SICH BITTE AN DEN HERSTELLER FUER RICHTIGE HILFE EHE SIE VERSUCHEN DIESES PRODUKT ZU OPERIEREN.

SI VOUS NE LISEZ OU NE COMPRENDRE ENTIEREMENT LES MATIERES DE CE MANUEL, S'IL VOUS PLAIT, CONTACTEZ L'USINE POUR L'ASSISTANCE APPROPRIEE AVANT D'UTILISER LE PRODUIT.

 DANGER

 CAUTION

These safety alert symbols identify important safety messages in this manual. When you see these symbols, be alert to the possibility of personal injury and carefully read the message that follows.

Do not allow anyone to operate the FLOOR PLANER without first reading this Operator Manual and becoming familiar with its operation. The manufacturer of the FLOOR PLANER has gone to great extremes to provide the owner(s) and/or operator(s) with the finest equipment available for its intended job function of removing covering materials from concrete and wood floor surfaces. Yet, the possibility exists that the FLOOR PLANER can be utilized in and/or subjected to job applications not perceived and/or anticipated by the manufacturer. Such misuse and/or misapplication of the FLOOR PLANER can lead to the possibility of serious damage, injury or even death. It is the responsibility of the owner(s) and/or operator(s) to determine that the FLOOR PLANER is being utilized and/or operated within the scope of its intended job function. It is the responsibility of the owner(s) and/or operator(s) to establish, monitor and constantly upgrade all safety programs and/or practices utilized in and for the operation of the FLOOR PLANER. The purpose of such programs is to provide for owner(s) and/or operator(s) safety. Operators must be instructed to recognize and avoid unsafe conditions associated with their work (29 CFR 1926.21 (b)(2)) and/or applicable updated revisions. It is the responsibility of the owner(s) and/or operator(s) to determine that no modifications and/or alterations have been made to the FLOOR PLANER. Modifications and/or alterations can lead to the possibility of serious damage, injury or even death. It is the responsibility of the owner(s) and/or operator(s) to make this Operator Manual available for consultation during all phases of operation. Refer to OSHA 2207 and/or applicable updated revisions which contains all OSHA job safety and health rules and regulations (1926 and 1910) covering construction.

⚠ CAUTION

The concept of frame mounted type FLOOR PLANERs has been successfully utilized for many years as a practical solution to many types of random FLOOR PLANER requirements. The basic concept is proven and well accepted within the associated marketplaces. Use of a FLOOR PLANER requires strenuous work activity. This type of work activity can be considered to be greater in magnitude than that experienced with the use of many other types of both light construction and lawn and garden related equipment. This type of work activity should only be attempted by operators of adequate physical size and stature, mental awareness and physical strength and condition. The body parts most noticeably affected during the planing process are the arms, hands, wrists, shoulders, lower back and legs. The process can also produce excessive stress/strain directly to the back muscles, spinal vertebrae and many other body parts. Back related pain can be a side effect of utilizing a FLOOR PLANER. An operator with a chronic back related problem or a history of back and/or other medically related problems should not attempt to utilize the FLOOR PLANER. Use of the FLOOR PLANER may only aggravate this and any other medically related problem. Because of the diverse type of prevailing job applications, job site conditions, operator experience levels and operator physical characteristics, no warranty, guarantee, representation and/or liability is made by the manufacturer as to the absolute correctness or sufficiency of any operational procedure, operational position and/or technique. There is no absolute guarantee that an operator of any given experience level, physical size and/or physical condition will be immune to the possibility of and/or probable physical side effects of the normal use of the FLOOR PLANER. Each potential operator must be made aware of and assume the operational and physical liability described and/or associated with the use of the FLOOR PLANER. Improper use of the FLOOR PLANER can result in property damage and/or personal injury, including death. Each potential operator not willing to assume the operational and physical liability described and/or associated with the use of the FLOOR PLANER, should not operate it. Proper levels of operator experience, skill and common sense are essential for maximizing the safe and efficient operation of the FLOOR PLANER.

Record the FLOOR PLANER and electric motor serial numbers in the spaces provided below.

_____ **Model Number**

_____ **Serial Number**

_____ **Engine/Electric Motor Serial Number**

_____ **Date of Purchase**

Specifications and design are subject to change without notice or obligation. All specifications are general in nature and are not intended for specific application purposes. Multiquip, Inc. reserves the right to make changes in design, engineering or specifications and to add improvements or discontinue manufacture at any time without notice or obligation. Multiquip, Inc. and its agents accept no responsibility for variations which maybe evident in actual products, specifications, pictures and descriptions contained in this publication.

OPERATOR INSTRUCTIONAL DATA SHEET

The following undersigned operators of the 8FP Series FLOOR PLANERS described and/or pertaining to this Operator Manual have received formal safety and operational information/instruction from the undersigned owner(s)/instructor(s) in accordance to OSHA 29 CFR 1926.21 (b)(2) and/or applicable updated revisions pertaining to, but not necessarily limited to the:

1) **READING, COMPREHENSION AND ACKNOWLEDGEMENT OF THE MATERIAL COMPRISING THE ENTIRE CONTENTS OF THE APPLICABLE OPERATOR MANUAL AND APPLICABLE SAFETY AND OPERATIONAL INFORMATION VIDEO TAPE FOR THE FLOOR PLANER.**

2) **FORMALIZED OPERATOR SAFETY PROGRAM TO BE DEvised BY THE OWNER OF THE FLOOR PLANER IN CONJUNCTION WITH THE CONTENTS OF THE APPLICABLE OPERATOR MANUAL AND THE APPLICABLE SAFETY AND OPERATIONAL INFORMATION VIDEO TAPE FOR THE FLOOR PLANER.**

4) **LOCAL LAWS, REGULATIONS AND CUSTOMS RESEARCHED FOR AND/OR BY THE OWNER OF THE FLOOR PLANER AND DEEMED APPLICABLE TO THE SAFE AND PROPER USE AND/OR OPERATION OF THE FLOOR PLANER FOR ANY SPECIFIC JOB APPLICATION.**

5) **FORMALIZED MAINTENANCE PROGRAM FOR THE FLOOR PLANER TO BE DEvised BY THE OWNER OF THE FLOOR PLANER IN ACCORDANCE WITH, BUT NOT NECESSARILY LIMITED TO, THE SPECIFICATIONS, GUIDELINES AND OPERATIONAL INFORMATION CONTAINED IN THE APPLICABLE OPERATOR MANUAL.**

6) **COMPREHENSIVE OPERATIONAL INSTRUCTIONS FOR THE CORRECT AND PROPER USE OF THE FLOOR PLANER AS PER THE CONTENTS OF THE APPLICABLE OPERATOR'S MANUAL, SAFETY AND OPERATIONAL INFORMATION VIDEO TAPE AND APPLICABLE MATERIAL INCLUDED IN THE NATIONAL ELECTRIC CODE®.**

_____ Operator	_____ Owner/Instructor	_____ Date
_____ Operator	_____ Owner/Instructor	_____ Date
_____ Operator	_____ Owner/Instructor	_____ Date
_____ Operator	_____ Owner/Instructor	_____ Date
_____ Operator	_____ Owner/Instructor	_____ Date
_____ Operator	_____ Owner/Instructor	_____ Date

NOTE: INSERT COPIES OF THIS PAGE WITHIN THE OPERATOR'S MANUAL IF SPACE FOR ADDITIONAL OPERATORS IS REQUIRED.

DANGER

THE FOLLOWING SAFETY PRECAUTIONS PROVIDE SOME COMMON SENSE GUIDES TO PROMOTE SAFETY AND EFFICIENCY WITH THE FLOOR PLANER. NO WARRANTY, GUARANTEE OR REPRESENTATION IS MADE BY THE MANUFACTURER AS TO THE ABSOLUTE CORRECTNESS OR SUFFICIENCY OF ANY INFORMATION OR STATEMENT. THESE SAFETY PRECAUTIONS ARE INTENDED TO DEAL PRINCIPALLY WITH COMMON PRACTICES AND CONDITIONS ENCOUNTERED IN THE USE OF THE FLOOR PLANER AND ARE NOT INTENDED TO BE ALL INCLUSIVE. PROPER LEVELS OF OPERATOR EXPERIENCE, SKILL AND COMMON SENSE ARE ESSENTIAL FOR SAFE AND EFFICIENT OPERATION.

DANGER

THE ENGINE EXHAUST FROM THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM. THIS STATEMENT IS MADE IN COMPLIANCE TO CALIFORNIA PROPOSITION 65.

DANGER

INCORRECT USE OF THE FLOOR PLANER CAN RESULT IN PROPERTY DAMAGE, PERSONAL INJURY OR EVEN DEATH. TO REDUCE THIS POSSIBILITY, GIVE COMPLETE AND UNDIVIDED ATTENTION TO THE JOB AT HAND AND FOLLOW THESE SAFETY PRECAUTIONS:

PREPARATION.

1) This FLOOR PLANER is specialized type of powered equipment, designed for a specific job function and requires adequate and thorough instruction BEFORE it is operated. The size, power, complexity and operating characteristics of this type of powered equipment would dictate that each operator must receive adequate, professional instruction regarding the proper operation of this FLOOR PLANER before being allowed to utilize it. BEFORE attempting to utilize this FLOOR PLANER, read this Operator's Manual, the applicable Safety and Operational Information Video Tape and the material supplied by the engine manufacturer to familiarize each operator with its correct operating procedures.

Avoid the urge not to take the necessary time to read this Operator's Manual before operating the FLOOR PLANER. DO NOT OPERATE THE FLOOR PLANER UNTIL EACH OPERATOR COMPLETELY COMPREHENDS THE CONTENTS OF THIS MANUAL AND THE APPLICABLE SAFETY AND OPERATIONAL INFORMATION VIDEO TAPE.

2) Develop a comprehensive program for the safe operation of the FLOOR PLANER by its owner(s) and/or operator(s). Such a program will include, but is not limited to: instructional requirements for operation, applicable OSHA requirements, local laws and regulations, job site safety and a FLOOR PLANER maintenance program. Constantly examine and upgrade this program to guarantee owner(s) and/or operator(s) safety. Each operator must be fully instructed regarding the specifics of this safety program.

3) Determine that the FLOOR PLANER is in its original, factory configuration and has not been modified in any manner. Many modifications can result in potentially dangerous configurations that can lead to property damage and/or personal injury. If there are any questions about possible modifications made to the FLOOR PLANER, contact the Customer Service Department for specific information BEFORE utilization. There is no charge for this service. Do not operate the FLOOR PLANER without the use of the original equipment V-belt and diamond blade guards. Use of the FLOOR PLANER without an approved belt guard and/or diamond blade guard can lead to property damage and/or personal injury.

4) Minors should never be allowed to operate the FLOOR PLANER. Bystanders, especially children and animals, should not be allowed in the area where the FLOOR PLANER is in use. The sawing process can result in flying particles being emitted at high velocity and striking the operator and/or onlookers. This can lead to the possibility of property damage and/or personal injury. Keep all body parts, loose clothing, foreign objects and onlookers clear of the rotating diamond blade, caster wheels, main wheels and flying particles.

5) Operators must be in adequate physical condition, mental health and not under the influence of any substance (drugs, alcohol, etc.) which might impair vision, dexterity or judgment. Working with the FLOOR PLANER is strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor BEFORE operating the FLOOR PLANER. Guard against the possibility of back related injuries. Always lift the FLOOR PLANER with leg muscles and not with the back.

SAFETY PRECAUTIONS

6) Prolonged use of the FLOOR PLANER (or other, similar machines) exposes the operator to vibrations which may produce Whitefinger Disease (Raynaud's Phenomenon). This phenomenon reduces the hand's ability to feel and regulate temperature, produces numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis. Anti-vibration systems do not guarantee that you will not sustain Whitefinger Disease. Therefore, continuous and regular users should closely monitor the condition of their hands and fingers. After each period of use, exercise to restore normal blood circulation. If any of the symptoms appear, seek medical advice immediately.

7) Clothing must be sturdy and snug fitting, but allow complete freedom of movement. Never wear loose fitting jackets, scarves, neckties, jewelry, flared or cuffed pants or anything that could become caught on controls or moving parts. Wear long pants to protect your legs. Protect your hands with heavy duty, nonslip gloves to improve your grip. Good footing is most important when operating the FLOOR PLANER. Wear sturdy boots with nonslip soles. Steel-toed safety shoes are highly recommended. Keep shoes properly laced. Never wear tennis shoes or other, similar type shoes which afford little or no protection. Wear an approved safety hard hat to protect the operator's head(s) where there is a danger of head injuries. Noise, generated by the operation of the FLOOR PLANER and the actual process itself, can damage your hearing. Wear approved sound barriers (ear plugs or ear muffers) to protect your hearing. Continuous and regular operators should have their hearing checked regularly.

8) Visually inspect the FLOOR PLANER, components, tools and accessories for damaged or worn parts. BEFORE each use:

a) Disconnect the engine spark plug wire or power source cable.

b) Clean and remove all accumulated foreign matter from the wheels and determine that each rotates freely.

c) Clean and remove all accumulated foreign matter from inside the mainframe area.

d) Inspect the V-belt drive for proper tension, wear and general condition. Replace each component as necessary.

e) Inspect the flail drum and flails/spacer washers for excessive wear and structural integrity. Replace each component as necessary. The flail drum and flails

rotate at high speed during the planing process and are subject to high wear rates.

f) Determine that operator controls work freely, all safety devices are operative and information decals are readable.

g) Check to see that the FLOOR PLANER and all related accessories are in good, mechanical condition BEFORE utilization.

h) Reconnect the spark plug wire or power source cable as applicable

9) Contact appropriate representatives to determine if/where electrical cables, gas lines and other hazardous items are buried under the work surface BEFORE utilization. The FLOOR PLANER and related accessories are not insulated. Contact with buried electrical cables, gas lines and other hazardous items can result in electrocution and/or an explosion.

10) Know how the controls operate. Know how to stop the engine or electrical motor quickly in an emergency. Always start the engine or electric motor according to the instructions as outlined in this manual to minimize the possibility of unexpected contact with the work surface. Unexpected contact with the work surface can cause loss of machine control, and the possibility of property damage and/or personal injury.

11) Ground the SP8/E electrically powered Floor Planer motor securely. Determine that any "grounding" wire and/or device is, in fact, properly grounding the motor. Failure to properly ground the motor may cause an electrical shock and/or electrocution, resulting in property damage and personal, injury including death. Electrical wiring and all connections should be performed by a qualified electrician. The electric motor is designed to operate from a 230 volt, AC power source. Determine that the electric motor is properly wired according to the intended and/or available power source. Operating the electric motor from an improper voltage/ampereage power source can result in property damage and/or personal injury.

12) When operating the 8FP/E electrically powered Floor Planer on a surface containing water or other electrically conducting liquid, special precautions must be taken to minimize the possibility of operator electrocution. For specific information, consult current National Electrical Code publications and OSHA publications 210-22D (or current revision) for construction sites and 555-3 (or current revision) for use around any area containing water

SAFETY PRECAUTIONS

13) Never exceed the recommended capacities of the FLOOR PLANER. Refer to the **Specifications** section of this manual for more detailed information.

OPERATION.

1) Give complete and undivided attention to the job at hand. Do not chew gum, smoke and/or use smokeless tobacco while utilizing the FLOOR PLANER. Do not attempt to eat and/or drink while utilizing the FLOOR PLANER. Determine that eyeglasses and/or hearing aid devices are properly secured

Use of the FLOOR PLANER is strenuous and causes fatigue. Help prevent the cause of an accident. Plan to take work breaks as required to help maintain proper mental and physical alertness.

2) This FLOOR PLANER is not sealed or insulated. Do not operate the FLOOR PLANER in an explosive atmosphere or near combustible materials. Refer to current OSHA® rules and regulations.

3) Gasoline is an extremely flammable fuel. Use extreme caution when handling gasoline or mixing fuel. Always utilize UL®, CSA® OR CE approved containers for the storage and transportation of fuel. Do not smoke or bring fire or flame near the fuel. Always shut off the engine and allow it to cool before refueling. Never remove the fuel tank filler cap while the engine is running. Never operate an engine without a fuel tank filler cap. Select bare ground for fueling and move at least 10 feet from the fueling spot before starting the engine. Wipe off any spilled fuel before starting the engine and check for leakage. If a fuel or oil leak is found, do not start or run the engine until the leak is fixed and the spillage has been wiped away. Take care not to get fuel or oil on your clothing. If this happens, change your clothing immediately. Before operating the FLOOR PLANER refer to the **Specifications** section of this manual for more detailed information regarding fuel and lubrication requirements.

4) The FLOOR PLANER is designed for use by one operator. Use of the FLOOR PLANER by more than one operator can lead to confusion and loss of control, resulting in property damage and/or personal injury. If it is felt that more than one person is required to operate the FLOOR PLANER, STOP and contact the Customer Service Department for specific operational and service/maintenance information. There is no charge for this service.

5) Do not operate the FLOOR PLANER with onlookers close by. Caution all onlookers to stand clear. The sawing process can result in flying particles being emitted at high velocity and striking the operator

and/or onlookers. This can lead to the possibility of property damage and/or personal injury. Keep all body parts, loose clothing and foreign objects clear of the rotating diamond blade.

6) Start the engine or electric motor according to the instructions as outlined in this manual to minimize the possibility of unexpected contact with the work surface. Unexpected contact with the work surface can cause the loss of machine control and the possibility of property damage and/or personal injury.

7) Start and operate the FLOOR PLANER only in a well ventilated area. Carbon Monoxide fumes given off by an engine are poisonous. Breathing these fumes can result in property damage and/or personal injury. Operate the FLOOR PLANER only when/where visibility and light are adequate for the job at hand. Work carefully. Always hold the operator handle firmly with both hands. Wrap your fingers around the handle, keeping it cradled between your thumbs and fingers. Always make sure the operator handle is in good condition and free of moisture, pitch, oil or grease. Wear gloves to improve your grip. Never leave the FLOOR PLANER running unattended.

8) Special care must be exercised on slippery conditions and on difficult, uneven surfaces. Watch for cracks, high spots and other, surface irregularities. Keep proper footing and balance at all times. The normal use of this machine is on level surfaces. Other terrains can be dangerous and should be avoided. Only properly trained operators should attempt these techniques.

9) Never start the engine or electric motor with the Floor Planer on cracked, uneven or irregular surfaces. Never start the engine or electric motor with the flails and/or flail drum in contact with the work surface. Such occurrences can lead to the loss of machine control and the possibility of property damage and/or personal injury.

10) Contact with a hot, engine muffler can cause property damage and/or personal injury. Remain clear of a hot, engine muffler. Do not over speed the engine by altering the governor setting or by disconnecting the engine governor. Serious damage to the engine and/or personal injury can result.

11) Because this FLOOR PLANER is classified as a low cost, hand held, low horsepower, portable type machine, it is limited in the number of practical and/or suitable job applications. A particular job site, actual surface conditions, job specifications and operator

SAFETY PRECAUTIONS

skill/common sense may dictate that a different type of machine (with characteristics of higher purchase cost, being mounted to a carrier vehicle, with greater horsepower and less mobility), method and/or process be utilized to properly complete the job with the degree of efficiency and safety required. Contact the Customer Service Department for specific information regarding suitable job applications, job sites surface conditions and operator experience/skill/common sense recommendations for this FLOOR PLANER BEFORE utilization. There is no charge for this service.

MAINTENANCE, REPAIR AND STORAGE.

1) Use only genuine, approved replacement parts and accessories for maintenance and repair. Use of parts and accessories manufactured by others can result in property damage and/or personal injury.

2) Follow the **Service** instructions as outlined in the appropriate section of this manual.

3) Always stop the engine or electric motor and disconnect the spark plug wire or power source cable BEFORE checking or working on the FLOOR PLANER.

4) Always properly maintain the FLOOR PLANER. Frequently check all fasteners and individual parts. Built in safety features are effective only if they are maintained in good working condition. Replace any questionable part or assembly with a genuine, factory approved, replacement part. Do not forsake proper maintenance for the price of a few replacement parts. Proper maintenance does not cost...it actually pays dividends. Do not attempt any maintenance repair work not described in this manual. Have such work performed at your dealer's service facility.

5) A worn or damaged engine muffler is a fire hazard and may cause loss of hearing. Check to see that the muffler is in good condition. If the muffler is equipped with a spark arresting device, determine that it is in proper working condition at regular service intervals. Replace the spark arresting device with an approved replacement if there is any question of its integrity. It is the responsibility of the owner(s) and/or operator(s) to provide for and properly maintain a USDA approved, spark arresting muffler in an operating area specified by law. Check with appropriate governing agencies for more specific information. The FLOOR PLANER must not be operated if the muffler is faulty or has been removed. Contact with a hot engine muffler can cause property damage and/or personal injury.

6) Do not operate the FLOOR PLANER without the use of factory approved V-belt and diamond blade guards that are maintained in proper structural condition.

7) Maintain all safety and operation decals in proper condition. If any decal becomes damaged and/or unreadable, replace with genuine, factory approved, replacement parts only.

8) The Floor Planer utilizes self locking hexagon head nuts to minimize the effects of vibration. Replace all self locking hardware with genuine, factory approved, replacement parts only.

9) Consult the material supplied by the engine or electric motor manufacturer for specific information relative to proper operational, lubrication and storage requirements.

ASSEMBLY INSTRUCTIONS/OPERATIONS

Assembly

The 8FP Series Floor Planer are shipped from the factory secured on a specially designed wooden pallet and protected from external damage by a corrugated carton or wood crate. If shipped with a corrugated carton, the Floor Planer can be secured to the pallet by wood laths nailed to the pallet body. Remove the carton or crate immediately upon receipt using suitable tools to remove the nails.

REMOVING THE FLOOR PLANER FROM THE PALLET.

Application: All Models.

Tools Required:

1 each, pliers.

1 each, claw hammer or hammer and an appropriate pry bar.

2 each, 1/2 inch wrenches.

The Floor Planer is secured to the pallet with steel banding. Using the pliers, cut and remove the banding. The Floor Planer is secured to the pallet with a tie-down clamp. Using the 1/2-inch wrenches, remove the tie-down clamp. The Floor Planer can then be removed from the pallet.

DANGER

WEAR SAFETY GLASSES AND OTHER APPROPRIATE SAFETY APPAREL WHEN CUTTING THE STEEL BANDING AND/OR REMOVING THE CORRUGATED/WOOD SHIPPING CRATE.

Visually inspect the shipment for freight damage and/or missing parts. If shipping damage is evident, contact the delivering carrier immediately to arrange for an inspection of the damage by their claims representative. Federal law requires that a claim be filed within a specific time period. If missing parts are detected, notify your dealer who will assist you in obtaining them.

The Floor Planer is shipped from the factory completely assembled. If ordered with the Floor Planer, the flail drum and flail kit are normally installed on the flail drum driveshaft. Additional flail drums and flail kits or replacement parts are normally shipped separately.

Check all fasteners for security. Consult a fastener torque chart for the proper torque value if any fastener is found to require retorquing.

FILLING THE ENGINE CRANKCASE WITH OIL.

Application: 8FP/G Series Floor Planer.

Note: Floor Planers are selected at random at the factory and test run. These units are shipped with oil in the engine crankcase and fuel drained from the fuel tank.

Tools Required:

1 each, small, clean funnel.

The 8FP/G Floor Planer is available equipped with a number of industrial quality, gasoline and diesel engines. Engines are not preserviced at the factory (see note above) and will require the addition of oil in the crankcase before being placed in service. Consult the material supplied by the engine manufacturer for the engine that has been ordered with your Floor Planer. Carefully review this material to become familiar with specific operating characteristic, recommendations and service requirements.

1) Determine the location(s) of both the oil filler and oil drain plug(s).

2) Wipe oil, dust and accumulated dirt from the filler plug area.

3) Using the funnel, fill the engine crankcase with a high-grade motor oil. Consult the material supplied by the engine manufacturer for proper amount, weight and service classification.

4) Replace the oil filler plug and tighten. Wipe off any excess oil spilled on the engine crankcase and Floor Planer.

5) Do not operate the engine unless proper oil level is maintained as per the material supplied by the engine manufacturer.

FILLING THE 8FP/G SERIES ENGINE FUEL TANK.

Tools Required:

1 each, small, clean funnel.

CAUTION

Never mix oil with gasoline. Four cycle engines are not designed to be operated with oil mixed with the gasoline.

1) Determine the location of the fuel tank filler cap.

2) Carefully clean the filler cap and surrounding area to insure that no dirt or debris falls into the fuel tank. Remove the filler cap.

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3) Using the funnel, fill the fuel tank with fresh, clean fuel according to the specifications outlined in the material supplied by the engine manufacturer. Do not overfill the tank or spill any fuel. If the fuel tank incorporates a screen mesh to prevent debris from falling into the tank, do not remove to increase the fill rate. Replace the filler cap. Wipe away any excess spilled fuel.

DANGER

MANY FUELS ARE EXTREMELY FLAMMABLE. DO NOT SMOKE NEAR THE FUEL TANK. DO NOT FILL THE FUEL TANK WITH THE ENGINE RUNNING OR IF IT IS HOT. ALLOW AMPLE TIME BETWEEN EACH REFUELING FOR THE ENGINE TO COOL.

Operation

THEORY OF OPERATION

Application: All Models.

The 8FP Series Floor Planers operate on the principle of various flail configurations being operated at high rotational speeds to make direct contact with a work surface. A series of flails are spaced and aligned on shafts that span a specified width and rotate on a drum that can be raised or lowered at the discretion of the operator. The specific flail configuration and impact rate directly affect the rate of material removal from the work surface, the resulting surface profile and texture.

The planing process is directly controlled by these conditions:

- 1) The use of a suitable mechanism (flail) of sufficient strength and hardness to impact the work surface and remove material while delivering an acceptable service life.
- 2) Sufficient static weight supporting the flails which allow them to effectively penetrate the work surface and remove material.
- 3) Adequate horsepower capable of propelling the rotating flails against the work surface to deliver acceptable productivity rates.

Since no two materials are exactly alike, no two work surface materials can be penetrated and removed by the exact same method. The nature of the planing process, along with operator experience, skill and common sense, would suggest that efficient and productive material removal is a matter of trial and error. Combinations of flail type, condition, configuration, spacing along the width of the flail drum and feed rate are direct factors that will determine the overall success of the job application.

FLAIL DESIGN AND APPLICATION.

While individual flail design and configuration may vary, basic operational characteristics are identical: impact a work surface material and remove a percentage of the material. This common operational characteristic has led to the development of two basic flail configurations:

- 1) High carbon, heat treated, alloy steel designed for direct contact and removal of the surface material. The high carbon content of the flail material also helps to improve service life
- 2) High carbon, heat treated, alloy steel with tungsten carbide inserts brazed into the flail body. The tungsten carbide inserts are intended to directly contact the work surface and remove material. The inserts effectively resist wear and usually deliver a substantially longer service life than the plain, heat treated steel types. The flail body is designed to serve as a matrix or support for the tungsten carbide inserts, hence the requirement for heat treatment. The heat treatment process also aids the flail body in resisting wear.

Several factors directly affect the selection of a flail design for a specific job application:

- 1) The type and amount of material to be removed from the work surface. Materials of higher yield and tensile strengths along with the actual volume of material to be removed will generally be the first factors under consideration.
- 2) Purchase costs versus service life. The original purchase cost of plain, heat treated steel flails must be compared against the substantially higher costs of tungsten carbide insert flails. In turn, these costs must be compared to anticipated service life. All flails, whether of high speed steel or tungsten carbide insert design, will eventually wear to the point of requiring replacement. The amount of unproductive time spent to replace worn flails on a job can be substantially greater than the actual replacement cost of many flails. It then becomes a balance between purchase cost, productivity, service life and labor cost.
- 3) Surface finish and texture. The finest grained surface finish available from the planing process is comparable to a "swept or broomed" like finish. FIGURE 1. If a smooth, flat finish is desired, the planing process must be followed with a grinding or polishing type process. Many job requirements may call for large amounts of material to be removed, but followed with additional specifications requiring a finer surface finish or texture. Many times these jobs dictate

ASSEMBLY INSTRUCTIONS/OPERATIONS

the use of an aggressive flail configuration because of productivity and cost considerations. Less aggressive flail configurations can then be utilized for the final finishing sequence. Generally speaking, the more aggressive the flail configuration, the more coarse the resulting finish and texture.

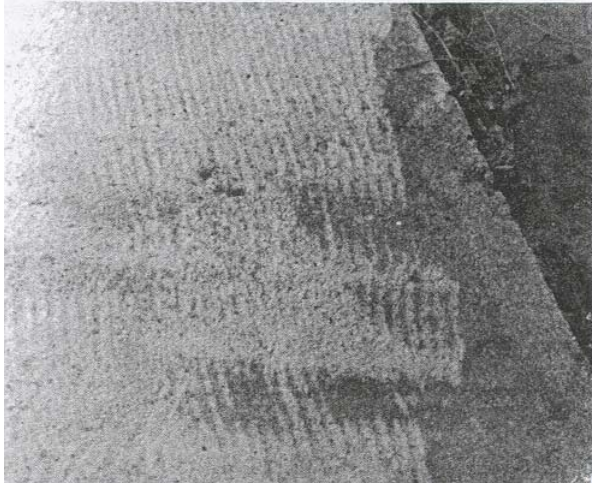


FIGURE 1

Many flail configurations are available to meet a wide variety of job application and surface material specifications. To give additional perspective to each configuration a rating system of 1 to 10 (10 being highest) has been devised.

Star Flail

The **star type flail** is manufactured from high carbon, alloy steel that is through hardened for additional service life. FIGURE 2. It is highly effective for light cleaning or scarifying and delivers a fine surface finish texture. Designed for medium to high speed material removal of the work surface.



FIGURE 2

Suggested Applications:

- 1) Removal of thin coatings and encrusted accumulations.
- 2) Cleaning concrete and asphaltic surfaces.
- 3) Removing thick material build-ups of greases, paints, oils, vegetable powders and some resins from wood floors.
- 4) Light scarifying prior to the application of coatings, toppings or sealers.
- 5) Light, steel deck descaling projects.

COST 1

PRODUCTIVITY 3

SERVICE LIFE 1. The star flail should be replaced when the outside diameter is worn to approximately 1-5/16 inch or the inside diameter elongates to approximately 3/4 inch.

Beam Flail

The **beam type flail** is manufactured from high carbon, alloy steel that is through hardened for additional service life. FIGURE 3. It is highly effective for scabbling or scarifying and delivers medium to coarse surface finish texture. Designed for medium to high speed material removal of the work surface.



FIGURE 3

ASSEMBLY INSTRUCTIONS/OPERATIONS

Suggested Applications:

- 1) Medium duty asphalt and concrete milling.
- 2) Descaling steel decks.
- 3) Removing thick material build-ups of greases, paints, oils, vegetable powders and resins from non-wood type floors.
- 4) Dried, fully cured, carpet and tile adhesive removal.
- 5) Painted traffic line removal.

COST 1

PRODUCTIVITY 5

SERVICE LIFE 2. The beam flail should be replaced when the outside diameter is worn to approximately 1-5/16 inch or the inside diameter elongates to approximately 3/4 inch.

Pentagonal Flail

The **pentagonal flail** is manufactured from high carbon, alloy steel that is through hardened for additional service life. FIGURE 4. Each section of the five sided design features a small, tungsten carbide insert that is first placed in a small hole and then held in position with copper brazing. It is highly effective for scabbling or scarifying and delivers medium to coarse surface finish texture. Designed for high speed material removal of the work surface.



FIGURE 4

Suggested Applications:

- 1) Heavy duty asphalt and concrete milling.
- 2) Milling concrete joints.
- 3) Asphalt and concrete grooving.

The **pentagonal flail** is designed for more aggressive

and rapid removal of a surface in comparison to the beam flail. The addition of the tungsten carbide inserts contributes to its long service life and higher production rates. The tungsten carbide is also the main reason for the cost differential between it and the other flails. The design configuration yields a rather coarse surface finish and texture. For many job applications, this finish and texture will be satisfactory. Some applications may require an additional smoothing process. For example: removing high spots or other irregularities from sidewalks. The initial process would utilize pentagonal flails for productivity and service life reasons. If the resulting surface finish is too coarse to meet specifications, it can be smoothed with the use of the star or beam flails.

COST 10

PRODUCTIVITY 8

SERVICE LIFE 10. The pentagonal flail should be replaced when two successive tungsten carbide inserts break off or the inside diameter elongates to approximately 3/4 inch. In service, the flail body will wear much faster than the tungsten carbide inserts. The copper brazing used to weld the inserts into the body can fail and an insert break off. The flail can still be used in service. It will just wear a little faster and more uneven in that particular area. As a general rule, a pentagonal flail can be utilized until there has been body wear that will no longer support the tungsten carbide inserts.

Milling Flail

The **milling flail** is manufactured from high carbon, alloy steel that is heat treated for additional service life. FIGURE 5. Each section of the five sided design features a rectangular, tungsten carbide insert that is held in position with copper brazing. The milling flail is primarily designed for "climb" milling applications. This requires that the Floor Planer be pulled toward the operator when being utilized. Removal rates are dependent upon both surface and substrate material composition.

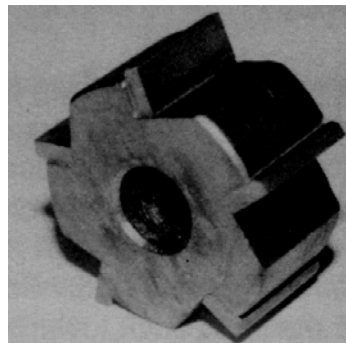


FIGURE 5

ASSEMBLY INSTRUCTIONS/OPERATIONS

Suggested Applications:

1) Removing synthetic coatings, thermoplastic and cold plastic marking and lines from concrete and asphaltic surfaces.

COST 10

PRODUCTIVITY 7

SERVICE LIFE 7. Milling flails are designed to remove a variety of traffic line materials from concrete and asphaltic type surfaces. With proper techniques, minimal amounts of parent work surface material will also be removed during the planing process. Milling flails are expensive. To realize maximum service life, milling flails should not be utilized for the direct removal of concrete and asphaltic work surface materials. Such use will drastically reduce their service life and substantially increase project costs.

SPACER WASHERS.

Spacer washers are stamped from high carbon, alloy steel that is heat treated for additional service life. FIGURE 6.

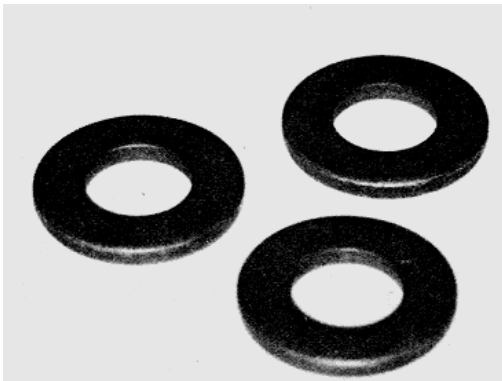


FIGURE 6

The Function of Spacer Washers

1) Reduce the number of flails required to be mounted on the flail drum, thus reducing purchase and operational costs.

2) Arrange the flails in a sequence or pattern that minimizes "blind" or "open" spots created by the additional support plates of the two section flail drum. Always insert at least one spacer washer between two (2) consecutive flails. The exception to this rule is a configuration where its design does not require the use of spacer washers. A flail drum set up with only star, beam or pentagonal flails and no spacer washers will not penetrate the work surface at satisfactory rates. Typical configurations minimize the hammering or impact action of the flails. However, this can also be useful when removing traffic lines.

3) Allow the flails to be arranged on the one section flail drum in configurations of specific widths for many job applications. An example would be the use of pentagonal flails to groove a concrete floor. The spacer washers are used to position the pentagonal flails at the desired width. FIGURE 7.

Variances in material thickness and manufacturing processes can affect the final thickness of both flails and spacer washers. Because of this occurrence, trial and error is important for assembling flails and spacer washers on a flail drum. By mixing and matching flails and spacer washers of specific thicknesses, the required number of components can be assembled on a flail drum in a minimum amount of time.

! DANGER

USE ONLY FACTORY SUPPLIED SPACER WASHERS ON THE FLAIL DRUM. OTHER WASHER TYPES AND/OR CONFIGURATIONS CAN PRODUCE ABNORMAL WEAR AND ELONGATION, RESULTING IN COMPLETE SEPARATION FROM THE FLAIL DRUM. SPACER WASHER SEPARATION CAN RESULT IN PROPERTY LOSS AND/OR PERSONAL INJURY.

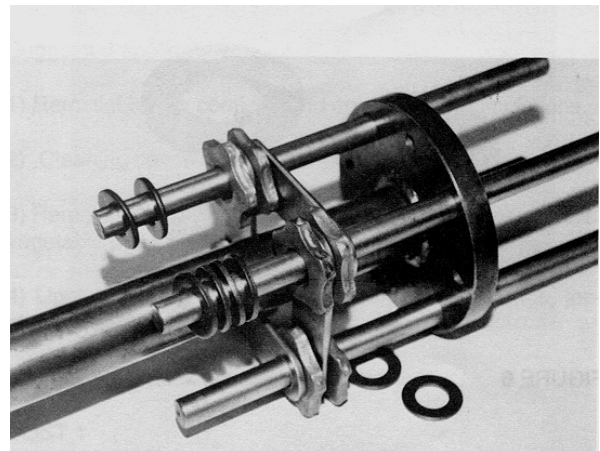


FIGURE 7

FLAIL DRUM RODS

Flail drum rods are manufactured from 1/2 inch diameter alloy steel. They are heat treated in a two step process that yields a surface hardness that resists wear and extends service life.

Drum rod service life is difficult to predict because of the large number of flail configurations and work surface materials. Normal wear should be uniform about the rod circumference. FIGURE 8.

ASSEMBLY INSTRUCTIONS/OPERATIONS

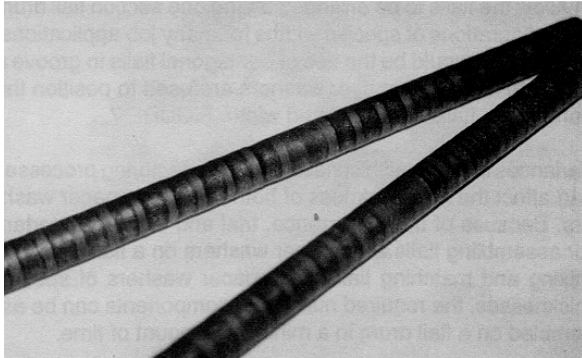


FIGURE 8
Problems encountered by uneven component wear

1) Inadequate free play exists between the flails/spacer washers and the support plates of the flail drum. If the flails and spacer washers do not have complete freedom of movement, they will not be capable of properly rotating about the flail drum rod. The result is rod wear confined to two locations that are usually 180 degrees apart. FIGURE 9. Variances in flail and spacer washer thicknesses affects free play when assembled on the drum. Because free play is also created during the planing process due to actual flail and spacer washer wear, a certain amount of "tightness" can sometimes be tolerated without affecting the service life of the drum rods or flails. The specific amount of "tightness" can usually be determined through trial and error. If the flails and spacer washers appear too tight on the drum, remove an appropriate flail or washer and reassemble the drum. If a short, operational test indicates normal component wear patterns, the apparent problem has been solved. A general rule for consideration: it is better to have the flails and spacer washers a "little too loose" on the drum than a "little too tight".

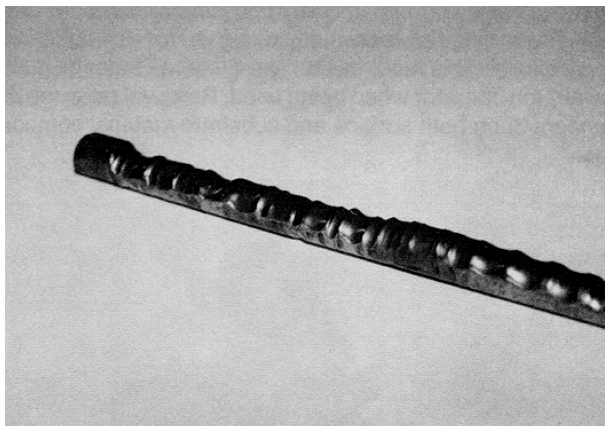


FIGURE 9

2) Mixing both worn and new flails on the drum. Proper flail action against the work surface material requires that the flails be of the same, approximate dimensions. Flails with various inside and outside dimensions will not impact the work surface material with the same intensity and deliver the same results. Flail rod wear is directly proportional to the amount of force it must supply against each, individual flail. When a rod can no longer supply adequate force against the flails, it will break, allowing the flails to be hurled against the inside of the Floor Planer frame. The more aggressive flails require greater forces to keep them contained on the rod. These forces, in turn, create faster and/or uneven rod wear rates.

Because flail drum rods are a critical component of the actual planing process, it is important that each rod be inspected on a regular basis to determine proper structural integrity.

! DANGER

INSPECT EACH FLAIL DRUM ROD ON A REGULAR INTERVAL TO DETERMINE PROPER STRUCTURAL INTEGRITY. USAGE RATES AND OTHER OPERATING PARAMETERS WILL DETERMINE PROPER INTERVAL RATES. IF THERE IS ANY QUESTION REGARDING THE VISUAL STRUCTURAL INTEGRITY OF A DRUM ROD, PROPERLY DISCARD AND REPLACE IT WITH AN APPROVED, FACTORY REPLACEMENT PART ONLY.

! DANGER

THE MINIMUM ALLOWABLE DRUM ROD DIAMETER IS 3/8 INCH AS MEASURED ALONG ANY PART OF ITS CIRCUMFERENCE AND/OR LENGTH. ANY DRUM ROD NOT MEETING THIS MINIMUM DIMENSION STANDARD SHOULD BE PROPERLY DISCARDED AND REPLACED WITH AN APPROVED, FACTORY REPLACEMENT PART ONLY.

! DANGER

UNDER NO CIRCUMSTANCE IS WELDING AND/OR ANY OTHER TYPE OF METAL BUILD-UP PROCESS ALLOWED TO BE PERFORMED ON A WORN DRUM ROD. TYPICAL MAINTENANCE TECHNIQUES CAN ALTER THE ORIGINAL HEAT

ASSEMBLY INSTRUCTIONS/OPERATIONS

TREATMENT PROCESS AND COMPROMISE THE STRUCTURAL INTEGRITY, RESULTING IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

On occasion, it may be necessary to remove severely worn drum rods from the flail drum by the use of a band saw or similar device. FIGURE 10. Proper preventative maintenance and operational procedures will minimize these occurrences.

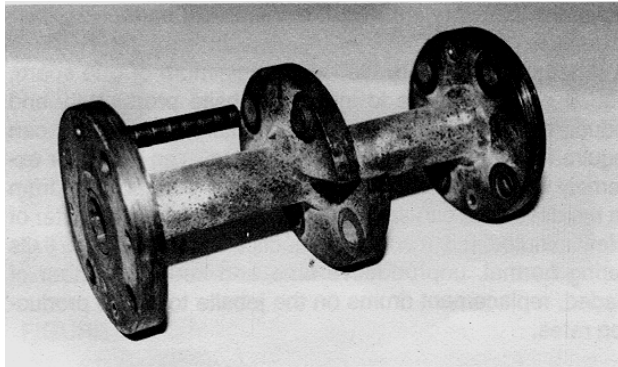


FIGURE 10

⚠ CAUTION

Utilize proper personal protection devices and exercise caution when attempting this procedure. Secure/stabilize the drum on a solid surface to prevent accidental rotation.

FLAIL DRUM DESIGN AND APPLICATION.

Flail drums are manufactured from alloy steel and heat treated to extend the service life. Drums are classified by the number of sections between the side plates.

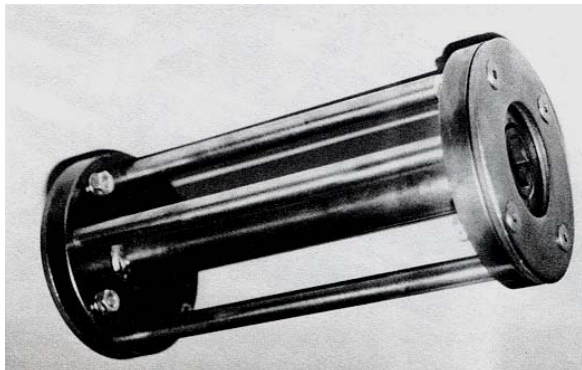


FIGURE 11

The one section flail drum incorporates the four flail rods supported only by the end plates. FIGURE 11. To provide additional stability and structural rigidity for the drum rods, four support straps are included as a standard accessory. These support straps can be installed about the flails in lieu of the standard spacer

washers. FIGURE 12. Additional support straps can also be assembled as required to provide for additional rigidity for the drum rods.

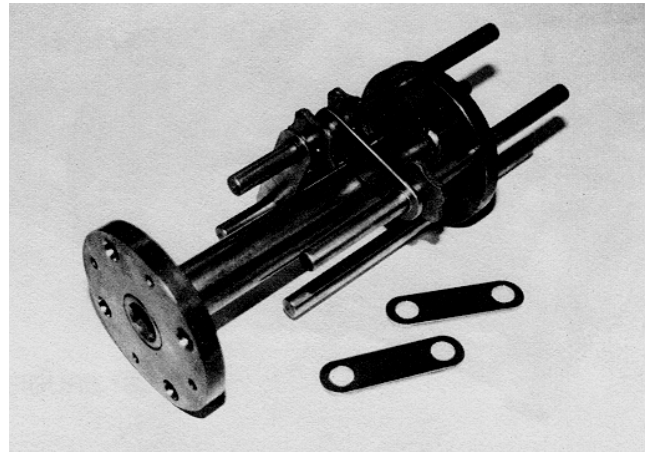


FIGURE 12

⚠ CAUTION

Never operate the one section drum without the use of a proper quantity of support straps to provide for additional stability and structural integrity. Property damage and/or personal injury can result.

The added flexibility of the one section flail drum can be especially useful on many, specialized job applications. These job applications are usually limited to grooving, or light scabbling and scarifying applications. Example: grooving concrete floors to minimize the chance of animals and humans from falling and sustaining injuries. This end result can be readily accomplished by the correct spacing of flails, spacer washers and support straps on a one section drum. FIGURE 13.

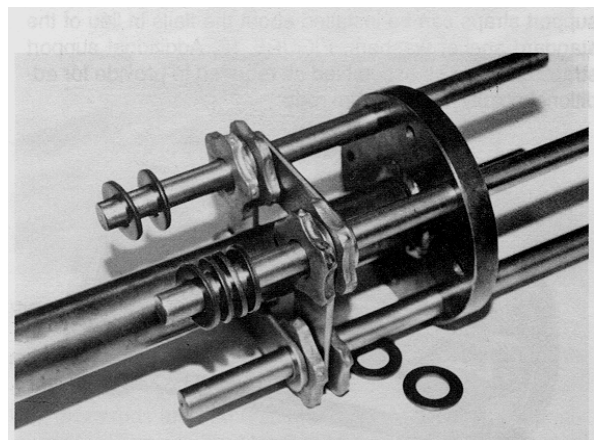


FIGURE 13

The most widely used drum is of the **two-section design**. FIGURE 14. It incorporates two half sectioned side plates that are positioned on the center shaft to facilitate optimum flail spacing. The half side plate sections also provide additional stability and structural rigidity for the drum rods. The two-section drum can accommodate the use of all flail designs while meeting the most demanding job applications.

General Notes Regarding Flail Drums

1) Flail drum rods are held in position by end caps and related fasteners. The end caps are heat treated to extend their service life.

2) The countersunk Allen head capscrews are retained to the flail drum by both self locking, hexagon head nuts and lock washers. The lock washers provide additional redundancy while eliminating open,

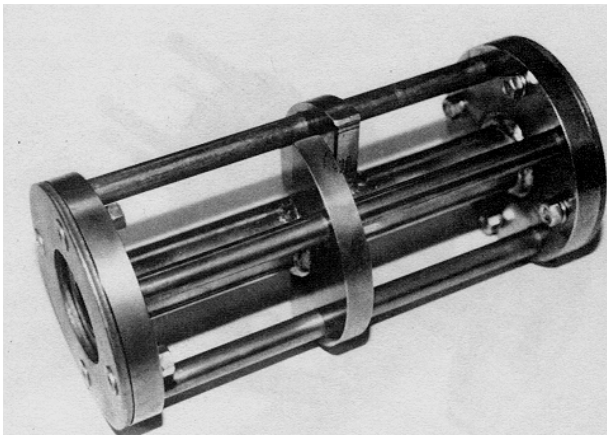


FIGURE 14

exposed threads that can become worn or damaged from field use. A countersunk Allen head capscrew was chosen over a conventional hexagon head capscrew to eliminate anticipated wear. Component wear would substantially increase the difficulty of disassembling drum components in the field. Before removing these capscrews, clean the internal hexagon with an appropriate tool to help facilitate their removal.

3) Flail rods are not intended to rotate in the drum assembly while the Floor Planer is in operation. Severe operation can cause the drum plates to wear and elongate. Drum rods are also subject to wear and elongation. If the total amount of wear is not severe, various types of high strength, anaerobic adhesives can be utilized to secure the rods to the drum. Severe component wear is always an immediate reason to reject either the rods and/or drum and replace with factory approved, replacement parts.

4) Regularly inspect the drum for excessive wear and signs of fatigue. Random vibration caused by the planing process is difficult, if not impossible, to fully predict. Component service life is impossible to predict. Work surface materials, operator techniques and general maintenance are also contributing factors that will limit the service life of the drum and/or components. If there is any question regarding the structural integrity of a drum or any component, properly discard and replace with factory approved, replacement parts.

5) It is advisable to always have a minimum of one spare, loaded drum available to increase job site productivity and reduce down time. Replacing worn flails is a job that can require from only a few, short minutes to even hours for extremely worn and damaged components. Replacing a drum on the driveshaft can usually be accomplished in a matter of a few minutes. It is a common practice to replace worn flails during normal, unproductive time and keep a number of loaded, replacement drums on the job site to speed production rates.

INSTALLING FLAILS ON THE TWO SECTION DRUM.

All flails are assembled on the two section drum in sequence patterns with the spacer washers. Spacer washers provide for an overlapping effect of the flails that produces consistent material removal from the work surface.

Normal installation procedure (fine finish) for star, beam and all 1/8-inch nominal thickness flails

1) Install a flail next to the outside side plate of the narrow section. Next, install a spacer washer. Follow with a flail and continue the sequence until the section is full. FIGURE 15.

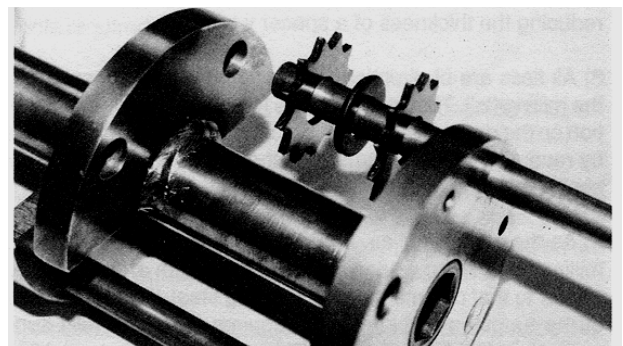


FIGURE 15

ASSEMBLY INSTRUCTIONS/OPERATIONS

2) Install a spacer washer next to the outside side plate of the wide section. Next, install a flail. Follow with a spacer washer and continue the sequence until the section is full. FIGURE 16.

Normal installation procedure (fine finish) for pentagonal flails

1) Install a spacer washer next to the outside side plate of the narrow section. Next, install a flail. Follow with a spacer washer and continue the sequence until the section is full. FIGURE 17.

2) Install a flail next to the outside side plate of the wide section. Next, install a spacer washer. Follow with a flail and continue the sequence until the section is full. FIGURE 18.

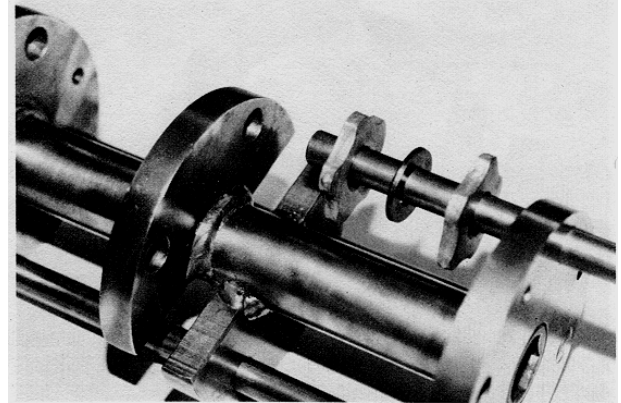


FIGURE 18

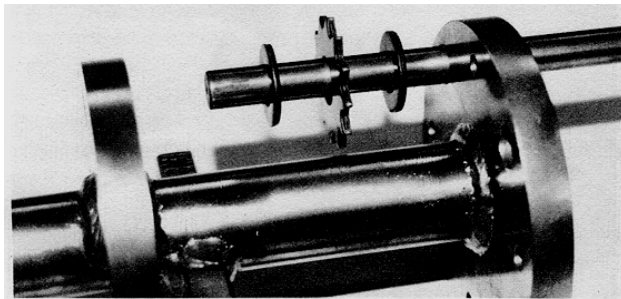


FIGURE 16

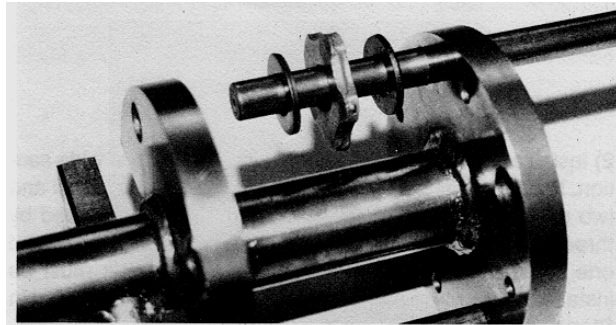


FIGURE 17

Normal installation procedure for milling flails

1) Install three spacer washers next to the outside side plate of the narrow section. Next, install a flail. Follow with two spacer washers and continue the sequence until the section is full. The tungsten carbide inserts must be installed to form a continuous planing surface. FIGURE 19.

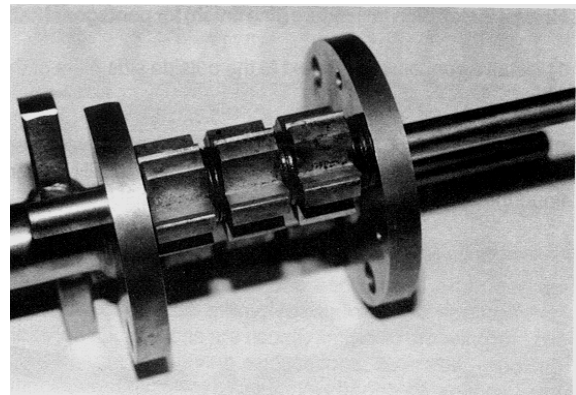


FIGURE 19

2) Install a flail next to the outside side plate of the wide section. Next, install two spacer washers. Follow with a flail and two spacer washers. Install another milling flail followed by three spacer washers. Finally, install the remaining flail and one spacer washer. The tungsten carbide inserts must be installed to form the same, continuous planing surface as in Step 1. FIGURE 20.

3) Milling flails can also be installed on the drum without the use of spacer washers.

ASSEMBLY INSTRUCTIONS/OPERATIONS

General Notes Regarding the Installation of Flails

1) Because of variance in material thickness and manufacturing tolerances, the specified number of spacer washers may not always fit within the narrow and wide sections. If this occurs, grinding a spacer washer to reduce its thickness is an option.

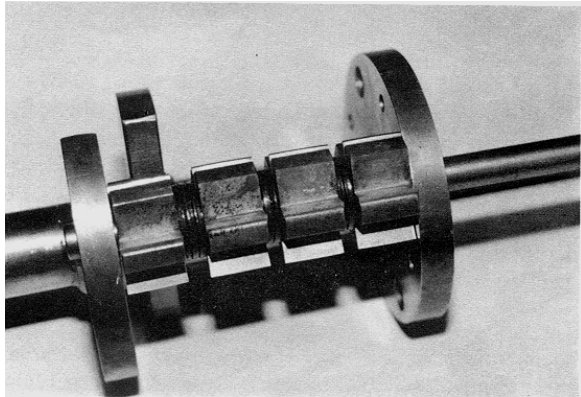


FIGURE 20

⚠ CAUTION

Exercise caution when grinding a spacer washer to reduce its thickness. Wear safety eye wear and other, appropriate safety apparel to minimize the potential for personal injury.

2) Flails require sufficient free play to allow them to properly impact the work surface material. If the flails fit too tight on the drum, inconsistent material removal and accelerated flail wear will result. The formation of rust between the flail and spacer washer surfaces will affect proper free play. Excessive free play can also accelerate the wear of flails and rods. As a general rule, flails should be free to rotate by hand after being installed on the drum. If this is not possible, the flails should be disassembled and additional free play provided by reducing the thickness of a spacer washer.

3) All flails are bi-directional in design with the exception of the milling flail. That is, there is no forward or reverse orientation on the drum. Fail service life can sometimes be extended by reversing their orientation on the driveshaft. The effect is similar to rotating tires on an automobile.

4) As the name implies, the tungsten carbide inserts of the milling flail cut the work surface material with an action very similar to that of a machine tool cutting

steel. The brittleness of the tungsten carbide insert requires that it be fully supported to minimize breakage. This requires a substantial flail body to provide the necessary support. The resulting configuration makes the milling flail one directional in design. This limitation requires the operator to install a loaded drum on the driveshaft with the tungsten carbide inserts facing the direction of rotation. FIGURE 21. If the tungsten carbide inserts face opposite to the direction of rotation, improper milling action and accelerated flail wear will occur.

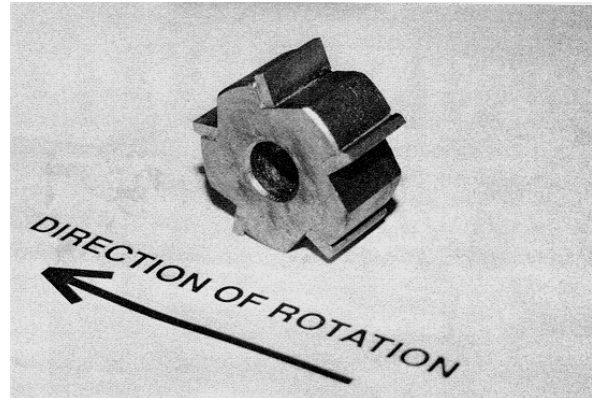


FIGURE 21

⚠ CAUTION

Before installing the drum on the driveshaft, make a close, visual inspection of the entire assembly. Determine that all flails and spacer washers are properly secured on the rods and that no loose flail or spacer washer has slipped its position during assembly. Flails and spacer washers can fall off the rods during assembly and become dislodged and unnoticed. When the loaded drum begins rotating at high speeds, these components can fly off the drum causing property damage and/or personal injury.

INSTALLING A LOADED DRUM ON THE DRIVESHAFT.

Application: All Models.

Tools required:

- 1 each, 3/4 inch wrench or equivalent.
- 1 each, torque wrench, 85 ft lbs (115 N.m) capacity with 3/4 inch socket.

1) If the Floor Planer is powered by an engine, disconnect the spark plug wire. If powered by an electric motor, properly disconnect the extension cord of Floor Planer from the power source.

2) Rotate the height adjustment lever located on the

ASSEMBLY INSTRUCTIONS/OPERATIONS

operator handle counterclockwise to raise the Floor Planer to its maximum height position above the work surface.

3) Using the wrench, remove the four (4) 1/2-inch diameter x 1 inch long capscrews and flat washers securing the drum access plate to the main frame.

4) Remove the drum access plate from the driveshaft.

5) Clean and remove any excessive material build-up from the threaded bosses and surrounding areas.

6) Install the loaded flail drum on the driveshaft. If utilizing the milling flails or other flail configurations that are unidirectional, determine that the flails are facing the direction of rotation. FIGURE 22.

7) Install the drum access plate on the driveshaft. The left, vertical side of the access plate should align tight against the main frame.

8) Install the four 1/2-inch diameter x 1 inch long capscrews and washers. capscrews should install with a minimal amount of resistance and related, alignment problems. Torque the capscrews to 85 ft lbs (115 N.m). No lockwashers or similar devices are required.

9) If the Floor Planer is powered by an engine, reconnect the engine spark plug wire. If powered by an electric motor and the machine is to be used immediately, reconnect the extension cord of Floor Planer to the power source. Determine that the ON/OFF switch located on the operator handle is in the OFF position.

! DANGER

UNEXPECTED MACHINE START UP CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

10) Removing a loaded drum from the driveshaft is accomplished by reversing the above steps.

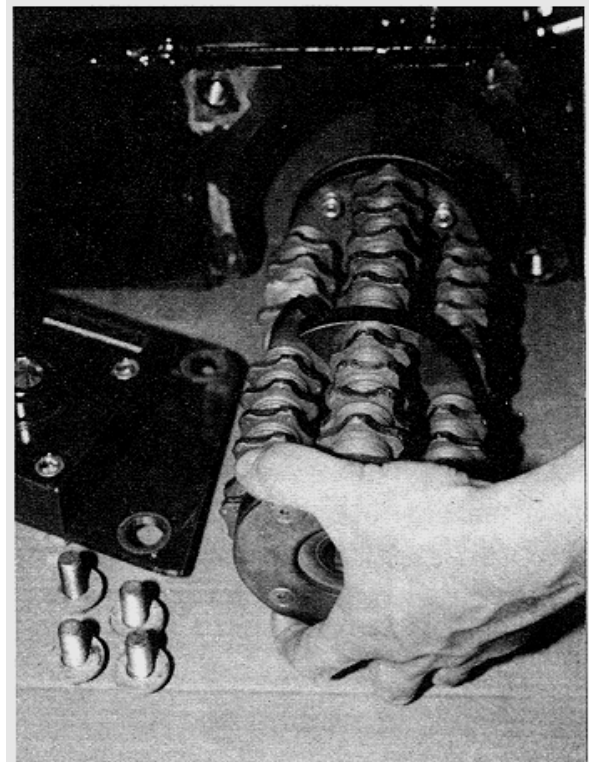


FIGURE 22

TRANSPORTING THE FLOOR PLANER.

Application: All Models.

The Floor Planer has an operational weight that prohibits one person from loading and/or unloading it alone by conventional, physical efforts.

! DANGER

DO NOT ATTEMPT TO LIFT THE FLOOR PLANER UP INTO A TRANSPORTATION VEHICLE WITH THE USE OF ONE PERSON ALONE. DO NOT ATTEMPT TO LOWER THE FLOOR PLANER FROM A TRANSPORTATION VEHICLE WITH THE USE OF ONE PERSON ALONE. LIFT AND/OR LOWER THE FLOOR PLANER ONLY BY THE USE OF A POWER TAILGATE UNIT, A SUITABLE HOIST UNIT OF PROPER CAPACITY AND/OR CONFIGURATION OR BY THE USE OF A PROPER QUANTITY OF PERSONNEL IN PROPER PHYSICAL CONDITION.

1) A lifting bail device can be used to facilitate lifting by

ASSEMBLY INSTRUCTIONS/OPERATIONS

a mechanical device incorporating a chain and suitable attachment device. The location of the lifting bail may not always locate the exact position of the center of gravity for the Floor Planer. A lifting handle is provided on the front of the main frame. This handle can be utilized by personnel whenever lifting/lowering the Floor Planer.

! DANGER

EXERCISE EXTREME CAUTION WHEN UTILIZING A MECHANICAL DEVICE FOR LIFTING THE FLOOR PLANER. UTILIZE THE MECHANICAL DEVICE IN ACCORDANCE TO BOTH ITS STATED STATIC AND DYNAMIC LOADING ENVELOPES. DO NOT UTILIZE THE MECHANICAL DEVICE UNTIL THIS INFORMATION IS PROPERLY KNOWN AND UNDERSTOOD BY ALL APPLICABLE PERSONNEL. FAILURE TO PROPERLY UTILIZE THE MECHANICAL DEVICE CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

When transporting the Floor Planer on a motor vehicle, the fuel tank breather vent (if so equipped) must be completely closed to eliminate the accidental seepage of fuel and resulting potential fire and environmental hazards. In order to minimize the possibility of damage to the Floor Planer, always transport in its normal, upright position. All equipment must be secured in/on vehicles with suitable strapping or tie-downs. Personnel should not be transported in the same compartment as equipment and fuel supplies. Consult applicable OSHA, AGA, CGA, etc. regulations for the proper transportation of gasoline and other, flammable gases.

STARTING THE 8FP/E SERIES ELECTRICALLY POWERED FLOOR PLANER ON THE JOBSITE.

- 1) Position the Floor Planer on a flat and level surface of firm foundation.
- 2) Determine that the ON/OFF switch located on the operator handle is in the OFF position.
- 3) Rotate the height adjustment lever located on the operator handle counterclockwise to raise the Floor Planer to its maximum height position above the work surface.

! DANGER

DO NOT ATTEMPT TO START THE MOTOR WITHOUT FIRST DETERMINING THAT THE LOADED DRUM IS NOT IN CONTACT WITH THE WORK SURFACE. IF THE ROTATING FLAILS COME IN CONTACT WITH THE WORK SURFACE BEFORE THE OPERATOR HAS ASSUMED FULL CONTROL, THE ACTION HAS THE POTENTIAL TO PULL THE FLOOR PLANER AWAY. A RUNAWAY FLOOR PLANER CAN CAUSE PROPERTY DAMAGE AND/OR PERSONAL INJURY.

4) The electric motor req a clean, 10 ampere, 230 VAC, 60 Hz nominal power source. A clean power source refers to the amperage available on the individual electrical circuit selected. Additional electrical products already utilizing the same circuit will reduce the available amperage, resulting in starting and operational difficulties.

! CAUTION

Operating the Floor Planer from a power source of improper voltage and amperage will result in unreparable damage to the electric motor and related controls.

5) Providing proper voltage and amperage levels to the electric motor is essential to obtain maximum productivity and service life. Low voltage and amperage levels will cause the motor to overheat. The motor is equipped with an automatic thermal protection device that will stop it before major internal damage can result. After the motor has cooled to an acceptable temperature level, the switch must be manually activated to restart. FIGURE 24.

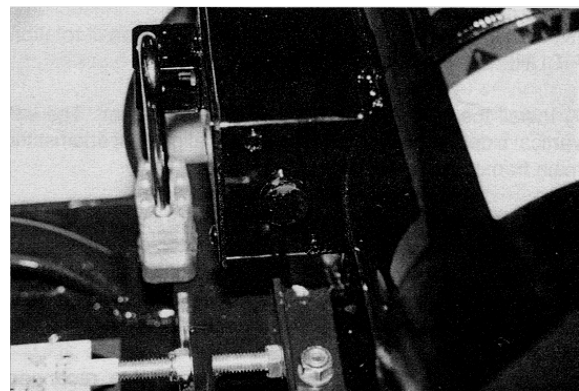


FIGURE 24

ASSEMBLY INSTRUCTIONS/OPERATIONS

To minimize the voltage drop to the motor, all extension cords should be copper stranded, 8 AWG or larger. A NEMA 6-20R twist lock type receptacle is provided with the 8FP/E Series Floor Planer as a standard accessory. The twist lock feature allows the extension cord to be pulled by the Floor Planer without becoming detached. Wire the NEMA 6-20R receptacle to the appropriate extension cord that will be coupled to the NEMA 6-20P plug provided on the Floor Planer. FIGURE 25.

⚠ DANGER

PROPERLY INSPECT ALL EXTENSION CORDS AND WIRING DEVICES FOR STRUCTURAL INTEGRITY. DO NOT UTILIZE A CORD WITH A WORN OR CUT OUTER JACKET MATERIAL. DO NOT UTILIZE A CORD WITH EXPOSED INNER WIRES OR INSULATION MATERIAL. DO NOT UTILIZE A CORD THAT HAS BEEN REPAIRED WITH ELECTRICAL TAPE. USE OF AN EXTENSION CORD OF IMPROPER STRUCTURAL INTEGRITY CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

⚠ DANGER

ALL ELECTRICAL WIRING MUST BE INSTALLED AND/OR APPROVED IN ACCORDANCE TO LOCAL ELECTRICAL CODES AND PRACTICES. AN IMPROPER WIRING INSTALLATION CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

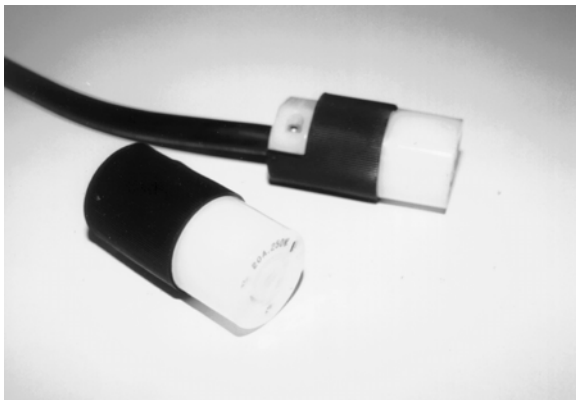


FIGURE 25

6) Determine that the power outlet to be utilized is properly grounded. This can be accomplished with proper testing equipment and procedures. If there are

any questions regarding the suitability of a specific power outlet, contact the Customer Service Department for assistance BEFORE utilizing the Floor Planer. There is no charge for this service. A qualified electrician can also be consulted. If a 115 VAC power source is selected, it is recommended that a properly tested, externally mounted, ground fault circuit interrupter (GFCI) be utilized at all times as an additional precaution. Ground fault circuit interrupters are not available for operation on 230 VAC. FIGURE 26.



FIGURE 26

⚠ DANGER

FOR MAXIMUM PROTECTION AGAINST A FAULT, ALWAYS CONFIGURE THE GROUND FAULT CIRCUIT INTERRUPTER TO BE PLUGGED INTO THE EXTENSION CORD. A CONFIGURATION WITH THE GROUND FAULT CIRCUIT INTERRUPTER PLACED BETWEEN THE POWER SOURCE AND THE EXTENSION CORD WILL NOT AFFORD MAXIMUM PROTECTION AGAINST A POTENTIAL FAULT.

7) Couple the NEMA 6-20R receptacle and the NEMA 6-20P plug together.

8) Grasp the operator handle with firm gripping. Turn the ON/OFF switch to the ON position.

When operating on 115 VAC, the electric motor will require additional starting time to help compensate for the additional starting amperage requirement. This time is usually within two seconds of activating the ON/OFF switch.

9) The 8FP/E Series electrically powered Floor Planer is not equipped with a centrifugal clutch assembly. The electric motor is directly coupled to the driveshaft by a V-belt reduction.

ASSEMBLY INSTRUCTIONS/OPERATIONS

DANGER

AS SOON AS THE ELECTRIC MOTOR HAS STARTED, THE OPERATOR MUST BE IN A POSITION TO ASSUME DIRECT AND FULL CONTROL OF THE FLOOR PLANER. FAILURE TO ASSUME DIRECT AND FULL CONTROL CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

10) The 8FP/E Series electrically powered Floor Planer is stopped by moving the ON/OFF switch located on the operator handle to the OFF position. For safety considerations, it is recommended that the extension cord be disconnected from both the Floor Planer and electric power source whenever the Floor Planer is not in use on the jobsite.

STARTING THE 8FP/G SERIES GASOLINE POWERED FLOOR PLANER ON THE JOBSITE.

1) Position the Floor Planer on a flat and level surface of firm foundation.

2) Rotate the height adjustment lever counterclockwise to raise the Floor Planer to its maximum position above the work surface. This will insure proper clearance between the loaded drum and the work surface.

DANGER

DO NOT ATTEMPT TO START THE ENGINE WITHOUT FIRST DETERMINING THAT THE LOADED DRUM IS NOT IN CONTACT WITH THE WORK SURFACE. IF THE ROTATING FLAILS COME IN CONTACT WITH THE WORK SURFACE BEFORE THE OPERATOR HAS ASSUMED FULL CONTROL, THE ACTION HAS THE POTENTIAL TO PULL THE FLOOR PLANER AWAY. A RUNAWAY FLOOR PLANER CAN CAUSE PROPERTY DAMAGE AND/OR PERSONAL INJURY.

3) Refer to the material supplied by the engine manufacturer for the correct starting, operation and stopping procedures.

4) Allow the engine to properly "warm up" and operate without the requirement for choking. Check for excessive machine noise and/or vibration.

DANGER

DO NOT OPERATE A GASOLINE ENGINE IN

CLOSED SPACES WITHOUT PROPER VENTILATION. GASOLINE ENGINES PRODUCE CARBON MONOXIDE FUMES. BREATHING CARBON MONOXIDE FUMES CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY. EXCESSIVE LEVELS OF CARBON MONOXIDE CAN CAUSE DEATH.

5) Stop the engine in accordance with the instructions as described in the material supplied by the engine manufacturer.

CAUTION

If the Floor Planer and/or an individual component/accessory does not appear to be functioning properly, STOP and do not further operate the Floor Planer until the proper corrective action has been completed. If there are any questions regarding the proper operation of the Floor Planer, contact the Customer Service Department BEFORE further utilization. There is no charge for this service.

OPERATING THE FLOOR PLANER ON THE JOB SITE.

Application: All Models.

DANGER

THE PLANING PROCESS PRODUCES EXCESSIVE NOISE, VIBRATION AND FLYING DEBRIS. ALL OPERATORS AND WORK PERSONNEL IN THE VICINITY OF THE FLOOR PLANER MUST WEAR APPROPRIATE SAFETY EYE WEAR AND HEARING PROTECTION DEVICES. OTHER SAFETY APPAREL AND/OR PROCEDURES, DEEMED NECESSARY BY SUPERVISORY PERSONNEL MUST ALSO BE WORN AND/OR PRACTICED BY ALL APPROPRIATE PERSONNEL.

DANGER

EXERCISE EXTREME CAUTION WHEN OPERATING THE FLOOR PLANER IN THE VICINITY OF DECK INSERTS, PIPES, COLUMNS, OPENINGS, LARGE CRACKS, UTILITY OUTLETS OR ANY OBJECT PROTRUDING FROM THE SURFACE. CONTACT WITH SUCH OBJECTS CAN LEAD TO LOSS OF MACHINE CONTROL, RESULTING IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

⚠ DANGER

DO NOT OPERATE A GASOLINE ENGINE IN CLOSED SPACES WITHOUT PROPER VENTILATION. GASOLINE ENGINES PRODUCE CARBON MONOXIDE FUMES. BREATHING CARBON MONOXIDE FUMES CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY. EXCESSIVE LEVELS OF CARBON MONOXIDE CAN CAUSE DEATH.

1) Flail cutting depth is controlled by the height adjustment lever. Rotate the lever counterclockwise to raise the flail drum off the work surface. Rotate the lever clockwise to lower the flail drum to the work surface. The height adjustment lever can be locked in position by dropping the connecting capscrew head through one of the two holes provided. FIGURE 27.

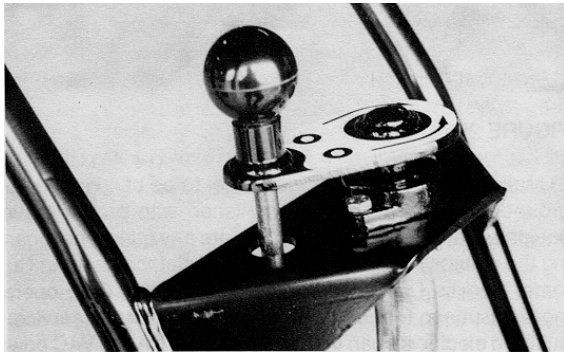


FIGURE 27

2) Proper operator position will enhance operational safety and overall productivity. FIGURE 28. Operate the engine at maximum, governed speed. Consult the material supplied by the engine manufacturer and the SPECIFICATIONS section for specific information.

3) The wide variety of potential work surface materials along with the corresponding variety of job site environments, makes it impossible to develop a standardized operating procedure for the Floor Planer. Use of the Floor Planer will require constant trial and error testing until satisfactory results are achieved. Experience gained over time and common sense will help to minimize the amount of necessary testing. Many factors will directly affect the operating parameters and/or techniques utilized for a specialized job application. Some of these factors include:

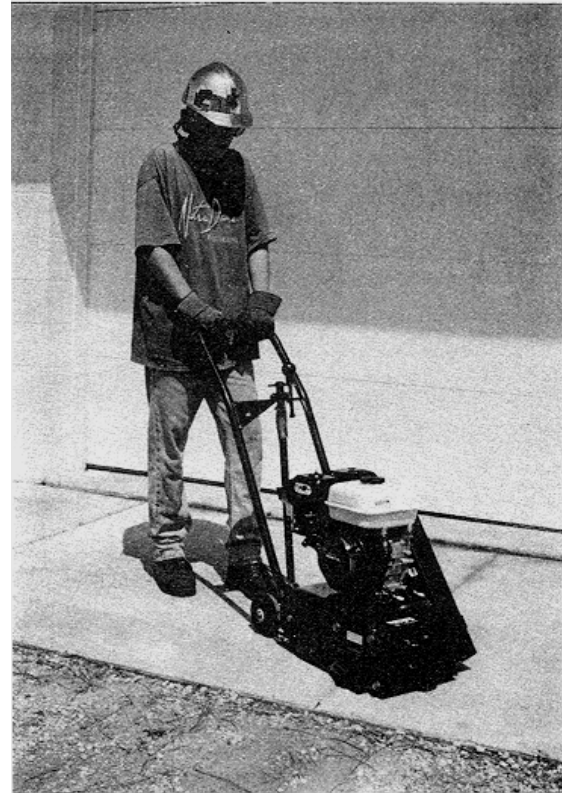


FIGURE 28

a) Work surface material yield and tensile value. As a general rule, these values will determine the cutting depth achieved in one pass. Materials with high yield and tensile values will characteristically resist/limit flail penetration. For such materials, the accepted procedure is to make a number of shallow passes over the work surface rather than attempt to make a single, deep pass. The net effect is to actually increase productivity: more material removed in less time. Other added benefits to this technique are decreased vibration, less operator fatigue and increased flail service life.

b) Higher material removal rates can sometimes be achieved by making a series of shallow passes 90 degrees to each other to form a waffle like pattern. This technique is especially useful when planing misaligned sidewalks and joints.

c) Job specifications may require a wide variety of work surface finishes and textures. The smoothest surface texture available from the Floor Planer is very similar to a "broom" type finish. If a smoother finish and texture is required to meet specifications, a grinding finish must be specified. This process utilizes

ASSEMBLY INSTRUCTIONS/OPERATIONS

a different process and can not be achieved with the Floor Planer.

4) The The Floor Planer features a "down feed" type design for the flail drum. The flail drum rotates forward and towards the front of the machine before the flails impact the work surface and remove material. The rotational direction of the drum produces a "self-propelled" effect that assists the operator when pushing the machine forward. Conversely, when the operator pulls the machine back towards himself, he must exert an additional force to overcome the "self-propelling" force.

ALWAYS MAINTAIN PROPER CONTROL OF THE FLOOR PLANER. IF AN OPERATOR LOOSES CONTROL OF THE MACHINE, A "RUNAWAY" FLOOR PLANER CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY. BECAUSE OF THE UNIQUE OPERATING CHARACTERISTICS OF THE FLOOR PLANER, THERE IS NO PROVISION FOR THE ELECTRIC MOTOR/ENGINE TO AUTOMATICALLY STOP IF THE OPERATOR FAILS TO MAINTAIN PROPER CONTROL.

! DANGER

WHEN OPERATING THE FLOOR PLANER ON ABOVE GROUND LEVELS, EXERCISE EXTREME CAUTION TO PREVENT LOSS OF CONTROL THAT COULD ALLOW THE MACHINE AND/OR OPERATOR TO FALL DOWN TO LOWER LEVELS. SUCH AN OCCURRENCE CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

5) Star, beam and pentagonal flail are bi-directional in design and can be operated in both forward and reverse directions. Milling flails are one directional in design. This limitation requires the operator to install a loaded drum on the driveshaft with the tungsten carbide inserts facing the direction of rotation. FIGURE 29. Remove work surface material only by pulling the Floor Planer towards the operator after the drum has been lowered to the desired cutting depth. Never push the Floor Planer forward when the milling flails are in contact with the work surface material.

This technique will allow the following to occur:

a) The milling flail "hammers" rather than "cuts" the material, producing ineffective results and substantial lower productivity.

b) Flail body material is subject to accelerated wear, especially in the area supporting the tungsten carbide insert. As this area wears, the insert becomes chipped

and can "break off" from the flail body, thus significantly reducing its efficiency and useful service life.

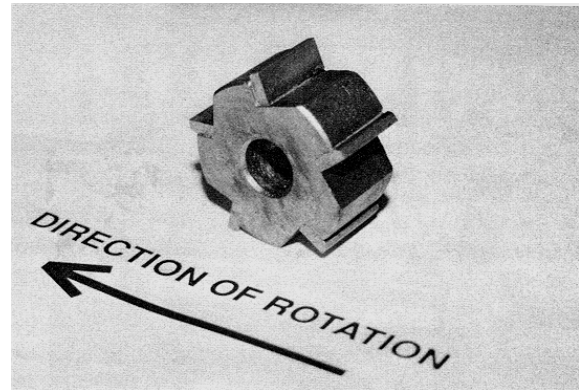


FIGURE 29

6) The maximum cutting depth on a slab surface is 5/8 inch. It is not recommended that the Floor Planer be utilized to achieve depths greater than this value.

7) The planing process on many work surface materials can produce sparks, dust and other foreign particle contamination.

! DANGER

SPARKS PRODUCED BY THE ACTIONS OF THE FLAILS IMPACTING AGAINST THE WORK SURFACE (FOR EXAMPLE: STRIKING ANCHOR BOLTS) DURING THE PLANING PROCESS MAY COME IN CONTACT WITH MATERIALS THAT CAN RESULT IN A FIRE AND/OR EXPLOSION. THIS OCCURRENCE CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

! DANGER

THE CREATION OF DUST AND OTHER FOREIGN PARTICLE CONTAMINATION FROM THE OPERATIONAL PROCESS CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY. FOR SUCH OPERATING CONDITIONS, ALWAYS WEAR A NIOSH/MSHA APPROVED DUST/MIST RESPIRATOR. CONSULT APPLICABLE OSHA REGULATIONS FOR SPECIFIC INFORMATION.

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Dust and other particle contamination can be controlled by the following methods:

a) The Floor Planer is equipped with a 1-1/2 or 3 inch outside diameter vacuum tube adaptor. The 1-1/2 inch diameter adaptor is located at the rear of the machine. The 3 inch diameter adaptor is located at the front of the machine. An industrial type vacuum cleaner can be attached to the Floor Planer to remove/control dust and other particle contamination from the work surface. A dipstick is provided for the 1-1/2 inch adaptor to prevent dust from exiting onto the operators shoes and pants when a vacuum is not attached. A plastic cover is provided for the 3 inch diameter adaptor. Remove the dipstick by pulling straight back toward the rear wheels. Insert a vacuum hose over the tube. A hose clamp is sometimes required to properly secure the vacuum hose to the tube. FIGURE 30.



FIGURE 30

⚠ DANGER

ALWAYS UTILIZE A VACUUM SYSTEM DESIGNED TO OPERATE WITHIN THE SPECIFIC JOBSITE REQUIREMENT. DUST MATERIAL CAN MEET CLASS II OR CLASS III SPECIFICATIONS OF THE NATIONAL ELECTRICAL CODE® FOR HAZARDOUS LOCATION CLASSIFICATIONS. CONSIDERATION MUST ALSO BE GIVEN TO THE CREATION OF HAZARDOUS TYPE MATERIALS REQUIRING SPECIFIC DISPOSAL PROCEDURES. DETERMINE THAT THE VACUUM SYSTEM IS PROPERLY DESIGNED TO OPERATE WITHIN THESE ATMOSPHERES. CONSULT CURRENT NATIONAL ELECTRIC CODE®, OSHA AND ENVIRONMENTAL PROTECTION AGENCY REGULATIONS FOR SPECIFIC INFORMATION.

b) The 8FG Series Floor Planers can be equipped with a 1/4 inch NPT water mist dust control fitting (option) on the main frame. This fitting is provided to allow the

installation of a valve and standard garden hose. Water can be regulated by the valve to minimize dust problems when a vacuum is not available or its use not desired. As a general rule, a small volume of water is required. It is not necessary to flood the work surface material. An added benefit is that the water can reduce the amount of heat generated by the planing process and significantly add to flail and bearing service life. FIGURE 31.

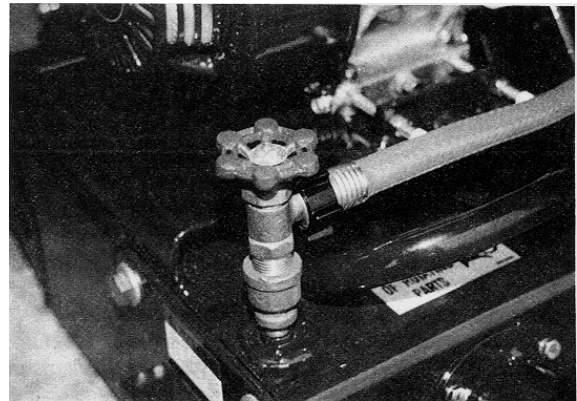


FIGURE 31

⚠ DANGER

WATER USED IN THIS PROCEDURE CAN ACT AS A CONDUCTOR OF ELECTRICITY. USE OF ALL ELECTRICALLY POWERED EQUIPMENT BEING OPERATED ON AND/OR AROUND THE VICINITY OF THE WET WORK SURFACE INCREASES THE POTENTIAL FOR ELECTROCUTION. CONSULT CURRENT NATIONAL ELECTRICAL CODES AND OSHA REGULATIONS FOR SPECIFIC INFORMATION.

⚠ CAUTION

When utilizing water to control dust and other particle contamination, thoroughly clean the interior surfaces of the Floor Planer to remove any material build-up. Failure to properly clean the interior surfaces can result in dried material build-up affecting operation and/or bearing service life.

c) Many oil based materials such as asphalt can quickly accumulate on components and severely restrict the ability of the flails to remove material from the work surface. Kerosene and other types of oil based solvents can be utilized to remove the accumulated material(s).

⚠ DANGER

ASSEMBLY INSTRUCTIONS/OPERATIONS

EXERCISE EXTREME CAUTION WHEN UTILIZING ANY SOLVENT TO REMOVE ACCUMULATED MATERIALS FROM THE SURFACES OF THE MACHINE AND RELATED COMPONENTS. MANY SOLVENTS ARE FLAMMABLE. DO NOT SMOKE OR INTRODUCE FLAME IN THE WORK AREA. PROVIDE ADEQUATE VENTILATION AND WEAR APPROPRIATE SAFETY APPAREL.

! DANGER

PROPERLY DISPOSE OF ALL ACCUMULATED MATERIALS PER OSHA AND ENVIRONMENTAL PROTECTION AGENCY CODES AND REGULATIONS. MANY ACCUMULATED MATERIALS CAN BE CLASSIFIED AS HAZARDOUS AND REQUIRE PROPER DISPOSAL PROCEDURES. CONTACT THE APPLICABLE GOVERNMENT AND/OR PRIVATE AGENCIES FOR SPECIFIC INFORMATION.

8) On job applications where the planing process creates a considerable amount of loose material, it can become almost impossible to determine proper cutting depths and the extent of work already accomplished. The problem is more compounded if a vacuum system is not used. Loose material should be removed by sweeping or other appropriate processes and the Floor Planer again used until conditions warrant removing the accumulated material.

Another side benefit of progressive housekeeping is increased V-belt life. The belt guard incorporates a bumper that is designed to push excess material away from the bottom sheave and minimize the amount of loose material that is picked up by the V-belt. Loose surface material can be extremely abrasive. A V-belt operating in these materials is subject to accelerated wear and premature failure.

STOPPING THE 8FP/E SERIES ELECTRICALLY POWERED FLOOR PLANER.

1) Rotate the height adjustment lever located on the operator handle counterclockwise to raise the Floor Planer to its maximum height above the work surface.

2) Stopping the Floor Planer is accomplished by moving the ON/OFF switch located on the operator handle to the OFF position. For safety considerations, it is also recommended that the extension cord be disconnected from both the Floor Planer and electric power source whenever the Floor Planer is not used on the jobsite.

STOPPING THE 8FP/G SERIES GASOLINE POWERED FLOOR PLANER.

1) Rotate the height adjustment lever located on the operator handle counterclockwise to raise the Floor

Planer to its maximum height above the work surface.

2) Stop the engine in accordance with the instructions as described in the material supplied by the engine manufacturer.

Service

PREVENTATIVE MAINTENANCE CHECK LIST.

Application: All Models

The normal operation of the Floor Planer produces extreme dirt and dust, along with high levels of random vibration. Before operating the Floor Planer, the following service list should be accomplished. This list is for reference only and is not intended to be all inclusive. Other subject areas can be added at the discretion of the owner(s) and/or operator(s):

1) Check all fasteners for proper torque values. If a fastener requires retorquing, consult a torque chart for proper value. Properly discard and replace any worn fastener with a factory approved, replacement part.

2) Check the V-belt for wear. Adjust or replace as necessary. Check pulleys for wear and proper proper alignment. Many loose materials created as a result of the operating processes can be extremely abrasive.

3) Keep the Floor Planer clean. Wash the unit after each use. Keep loose material from accumulating around engine cooling fins. Determine that the interior sections of the frame are free of material build-ups. Such build-ups can restrict the operating process and present a potential safety hazard. Clean and remove any material build-up from the Floor Planer after each use.

4) Engine service life can be extended with proper air cleaner maintenance. Consult the material supplied by the engine manufacturer for specific information.

5) Check for proper engine oil level. Always use clean, high quality engine oil. Change oil as required. Consult the material supplied by the engine manufacturer for specific information.

6) Remove material accumulations from the exterior surfaces of the electric motor. The electric motor is a totally enclosed, fan cooled (TEFC) design. Keep the fan fins clear of material accumulations to enhance air flow over the motor exterior for cooling purposes.

! DANGER

DO NOT PERFORM PREVENTATIVE MAINTENANCE CHECKS WITH THE ENGINE OR ELECTRIC MOTOR RUNNING. STOP THE POWER SOURCE AND DISCONNECT THE SPARK PLUG

ASSEMBLY INSTRUCTIONS/OPERATIONS

OR EXTENSION CORD BEFORE PERFORMING ANY MAINTENANCE TO THE FLOOR PLANER. RECONNECT THE SPARK PLUG BEFORE RESTARTING THE ENGINE. IF ELECTRIC MOTOR EQUIPPED, TURN THE ON/OFF SWITCH TO THE OFF POSITION BEFORE RECONNECTING THE EXTENSION CORD. IMPROPER PROCEDURES CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

CHECKING V-BELT TENSION AND ALIGNMENT.

Application: All Models.

Proper V-belt tension and alignment are essential for smooth transmission of horsepower and extended service life. Improper tension and alignment will accelerate V-belt wear and contribute to decreased productivity. The V-belt is tensioned at the factory with the maximum recommended tension force. Check the belt tension at least two times during the first day of operation, as there will normally be a rapid decrease in belt tension until the belt has run in. Check the belt tension every eight hours of operation thereafter and maintain tension within the recommended range. The correct operating tension for a V-belt drive is the lowest tension at which the belt will not slip under peak load conditions.

Tools Required:

1 each, 16 inch minimum length straightedge.
1 each, 10 lbs minimum capacity, tension scale or belt tension tool.

1) If the Floor Planer is powered by an engine, disconnect the spark plug wire. If powered by an electric motor, disconnect the extension cord or Floor Planer from the power source.

2) Position the Floor Planer on a suitable work bench with the V-belt approximately at waist level.

3) Using the 9/16 inch wrench, remove the belt guard from the main frame. Clean the inside of the belt guard with an appropriate solvent. Check for signs of wear and damage.

⚠ CAUTION

Observe all applicable safety precautions for the solvent.

4) Check belt tension using the spring scale or belt tension tool midway between the engine and driveshaft pulleys. Belt deflection should measure approximately 3/16 inch at 3-7/8 to 5-1/2 lbs force. FIGURE 32. If tension is within specifications, proceed to Step 4. If tension is not within specifications, refer to INSTALLING A REPLACEMENT V-BELT for specific information.

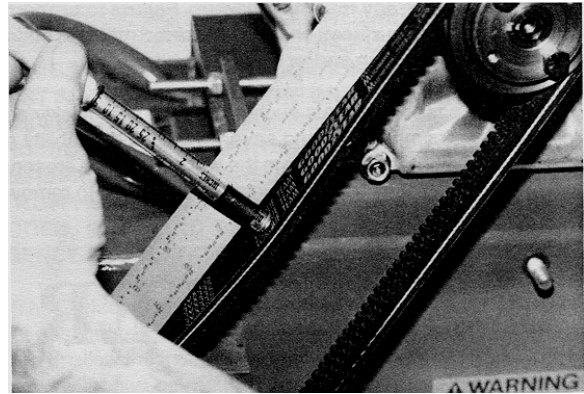


FIGURE 32

5) Belt alignment is checked with the straightedge. Place the straightedge squarely against the driveshaft pulley. Properly aligned pulleys should also place the straightedge squarely against the engine pulley. FIGURE 33. Remove the straightedge and rotate the engine pulley 120 degrees. Recheck alignment with the straightedge. Repeat the process until the engine pulley is rotated a full 360 degrees. Maximum allowable misalignment is $\pm 1/32$ inch. If pulley alignment is not within specifications, refer to INSTALLING A REPLACEMENT V-BELT for specific information.

6). Install the belt guard to the main frame. Install the flat washers and self-locking hexagon nuts. Torque the nuts to 35 ft lbs (47 N.m). Determine that all safety related decals affixed to the belt guard are fully readable. If any decal is not fully readable, replace with a factory approved, replacement part only.

7) If the Floor Planer is powered by an engine, reconnect the engine spark plug wire. If powered by an electric motor and the machine is to be used immediately, reconnect the extension cord or Floor Planer to the power source. Determine that the ON/OFF switch located on the operator handle is in the OFF position.

⚠ DANGER

UNEXPECTED MACHINE START UP CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

ASSEMBLY INSTRUCTIONS/OPERATIONS

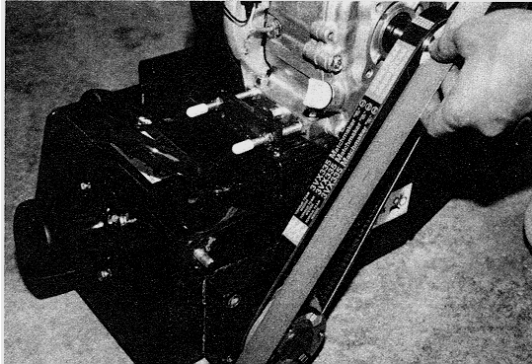


FIGURE 33

INSTALLING A REPLACEMENT V-BELT OR PULLEY

Application: As Specified.

Tools Required:

- 1 each, 7/16 inch wrench.
- 2 each, 1/2 inch wrenches.
- 1 each, 9/16 inch wrench.
- 1 each, 16 inch minimum length straightedge.
- 1 each, 10 lbs minimum capacity, tension scale or belt tension tool.
- 1 each, torque wrench, 35 ft lbs (47 Nm.) capacity with 7/16 inch and 9/16 inch sockets.

Parts Required:

- 1 each, PN 29020-056 V-belt 3VX335 (if required).
- 1 each, PN 29020-038 bushing (if required).
- 1 each, PN 29020-037 pulley (if required).
- 1 each, PN 10057-016 key (if required).
- 1) If the Floor Planer is powered by an engine, disconnect the spark plug wire. If powered by an electric motor, disconnect the extension cord or Floor Planer from the power source.

2) Position the Floor Planer on a suitable work surface with the V-belt approximately at waist level.

3) Using the 9/16 inch wrench, remove the belt guard from the main frame. Clean the inside of the belt guard with an appropriate solvent. Check for signs of wear and damage.

⚠ CAUTION

Observe all applicable safety precautions for the solvent.

3) Using a 1/2 inch wrench, remove the self locking nuts on the engine/electric motor take-up capscrews. Rotate the take-up capscrews until the hexagon head contacts the threaded mounting plate.

4) Using the 1/2 inch wrenches, loosen the engine/electric motor attachment capscrews, and slide the engine/electric motor toward the front of the main frame. FIGURE 34.

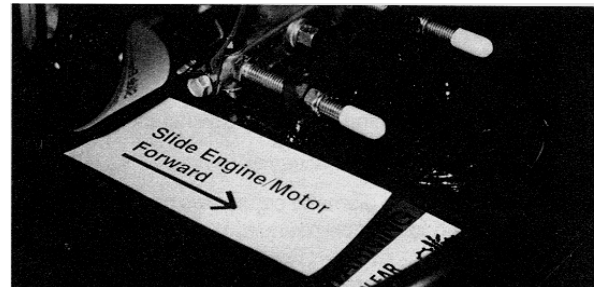


FIGURE 34

5) Remove the worn belt and install the replacement V-belt, PN 29020-056 (3VX335).

a) Do not install a replacement belt if the pulleys have worn grooves. Such pulleys should be replaced to insure proper belt fit. Operating the V-belt in worn pulley grooves will accelerate V-belt wear and significantly reduce its service life.

b) A V-belt should never be forced over a pulley. More belts are broken from this cause than from actual failure in service.

c) Keep the belt as clean and free of foreign material as possible. Do not use belt dressing.

6) Reinstall the engine/electric motor take-up capscrews with the heads facing toward and in contact with the engine crankcase/electric motor thrust plate. Tighten the engine/electric motor attachment capscrews until they just begin to apply tension to the engine/electric motor. **DO NOT OVER TIGHTEN.** Alternately tighten the take-up capscrews until slight tension is applied to the V-belt.

7) The driveshaft pulley should be positioned within 1/16 inch if the shaft shoulder. If the distance exceeds this limit, proceed as follows:

a) Using the 7/16 inch wrench, remove the two 1/4 inch diameter capscrews from the bushing.

b) Insert the capscrews into the tapped holes in the bushing flange. Tighten progressively until the bushing disengages from the pulley.

c) Insert the 1/4 inch diameter capscrews into the tapped holes in the pulley. Tighten progressively until the bushing applies tension to the pulley. FIGURE 35.

ASSEMBLY INSTRUCTIONS/OPERATIONS

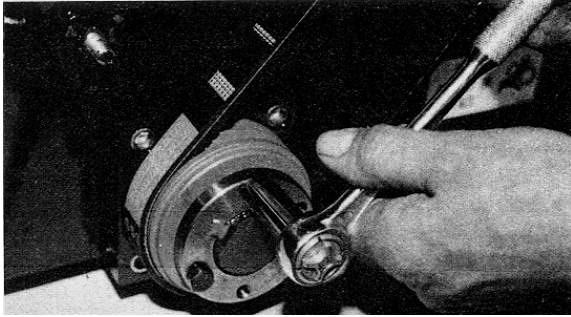


FIGURE 35

d) Tap the pulley/bushing assembly against the shaft shoulder with the soft hammer.

e) Tighten the 1/4 inch diameter capscrews progressively with a torque wrench to 95 inch pounds.

Note: this installation procedure is also used when installing replacement pulleys.

8) Belt alignment is checked with the straightedge. Place the straightedge squarely against the driveshaft pulley. Properly aligned pulleys should also place the straightedge squarely against the engine/electric motor pulley. Remove the straightedge and rotate the engine pulley 120 degrees. Recheck the alignment with the straightedge. Repeat the process until the engine/electric motor pulley has been rotated a full 360 degrees. Maximum allowable misalignment is $\pm 1/32$ inch. FIGURE 36.

If engine crankshaft/electric motor pulley alignment needs to be adjusted, proceed as follows:

a) Using the 7/16 inch wrench, remove the two 1/4 inch diameter capscrews from the engine pulley bushing.

b) Insert the capscrews into the tapped holes in the bushing flange. Tighten progressively until the bushing disengages from the pulley.

c) Insert the 1/4 inch diameter capscrews into the tapped holes in the pulley. Tighten progressively until the bushing applies tension to the pulley.

d) Using the straightedge for reference alignment purposes, tap the engine/electric motor pulley/bushing into proper position.

e) Tighten the 1/4-inch diameter capscrews progressively with the torque wrench to 95 inch pounds. FIGURE 37.

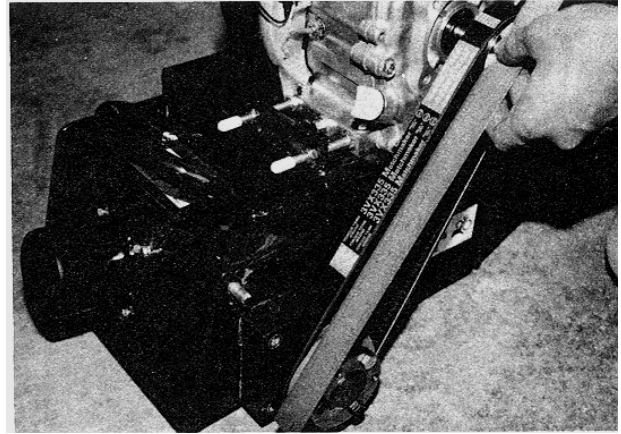


FIGURE 36

f) Recheck alignment as outlined per the beginning of Step 8.

9) Apply increased belt tension by progressively tightening the take-up capscrews against the engine crankcase/electric motor thrust plate.

a) Recheck V-belt alignment.

b) Check belt tension with the spring scale or belt tension tool midway between the engine/electric motor and driveshaft pulleys. Belt deflection should measure approximately 3/16 inch at 3-7/8 to 5-1/2 pounds force. FIGURE 38.

c) If belt tension and alignment is within specifications, torque the engine/electric motor attachment capscrews to 20 ft lbs (27 Nm.)

d) Recheck V-belt tension and alignment.

10) Install the belt guard to the main frame. Install the flat washers and self-locking hexagon nuts. Torque the nuts to 35 ft lbs (47 Nm.). Determine that all safety related decals affixed to the belt guard are fully readable. If any decal is not fully readable, replace with a factory approved, replacement part only.

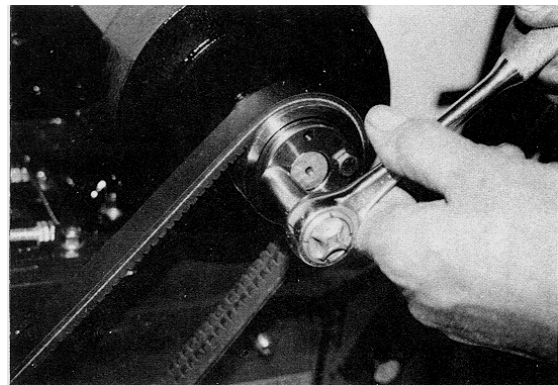


FIGURE 37

ASSEMBLY INSTRUCTIONS/OPERATIONS

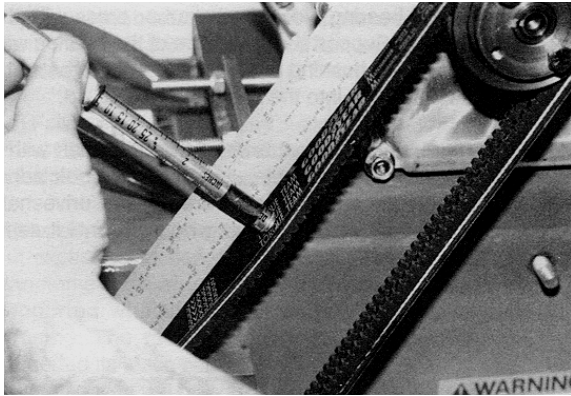


FIGURE 38.

11) If the Floor Planer is powered by an engine, reconnect the engine spark plug wire. If powered by an electric motor and the machine is to be used immediately, reconnect the extension cord or Floor Planer to the power source. Determine that the ON/OFF switch located on the operator handle is in the OFF position.

! DANGER

**UNEXPECTED MACHINE START UP CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.
INSTALLING A REPLACEMENT BEARING ON THE V-BELT SIDE.**

Application: All Models.

Tools Required:

- 1 each, 9/16 inch wrench.
- 1 each, 7/16 inch wrench.
- 1 each, torque wrench, 35 ft lbs (47 Nm.) capacity with 9/16 inch socket.
- 1 each, 5/16 inch Allen wrench.
- 1 each, pliers for large, external type snap rings.
- 1 each, shop press.

Parts Required:

- 1 each, PN 29020-016 sealed ball bearing.
- 1 each, container of bearing and shaft locking grade, anaerobic adhesive/sealant.
- 1 each, PN 290020-011 snap ring (if required).
- 1 each, PN 29020-015 driveshaft (if required)

1) If the Floor Planer is powered by an engine, disconnect the spark plug wire. If powered by an electric motor, disconnect the extension cord or Floor Planer from the power source.

- 2) Position the Floor Planer on a suitable work surface with the V-belt approximately at waist level.
- 3) Using the 9/16 inch wrench, remove the belt guard

from the main frame. Clean the inside of the belt guard with an appropriate solvent. Check for signs of wear and damage.

! CAUTION

Observe all applicable safety precautions for the solvent.

4) Remove the V-belt and driveshaft pulley. Refer to **INSTALLING A REPLACEMENT V-BELT OR PULLEY** for specific information.

5) Using the 5/16 inch Allen wrench and 9/16 inch wrench, remove the bearing block/driveshaft assembly from the main frame. For accuracy and alignment purposes, the main frame incorporates tapped holes to properly position the capscrews.

6) Position the driveshaft assembly on a suitable work surface. Use the snap ring pliers to remove the snap ring. FIGURE 39. Remove the spacer.

! CAUTION

Wear safety glasses and other appropriate safety apparel when removing the snap ring or performing any work with an arbor press. Caution all onlookers about the possibility of flying debris and personal injury.

7) Position the driveshaft assembly in a suitable arbor press. Determine that the outer race of the bearing is properly supported. Press the bearing/driveshaft assembly from the bearing block. FIGURE 40. Reposition the assembly and press the bearing from the bearing block. FIGURE 41.

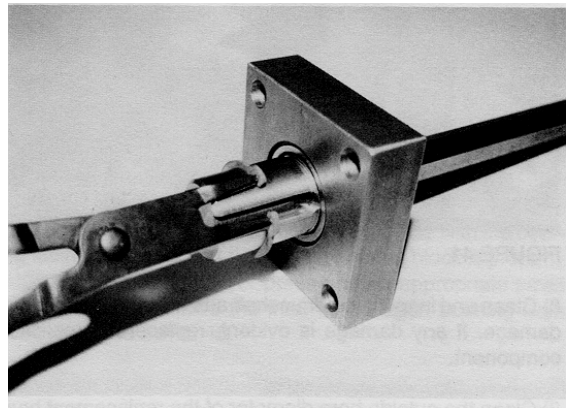


FIGURE 39

ASSEMBLY INSTRUCTIONS/OPERATIONS

8) Clean and inspect the driveshaft and housing for wear and damage. If any damage is evident, replace the applicable component.

9) Clean the outside bore diameter of the replacement bearing. Apply a suitable amount of anaerobic adhesive/sealant to the outside diameter of the bearing. Press the replacement bearing into the bearing housing until its seats itself against the flange. FIGURE 42.

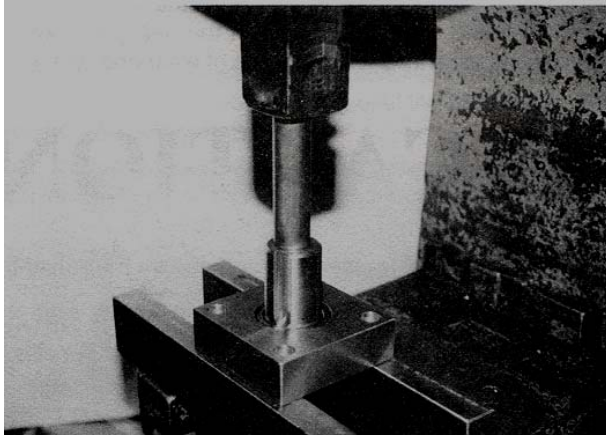


FIGURE 40

⚠ CAUTION

Wear safety glasses and other appropriate safety apparel when removing the snap ring or performing any work with an arbor press. Caution all onlookers about the possibility of flying debris and personal injury.

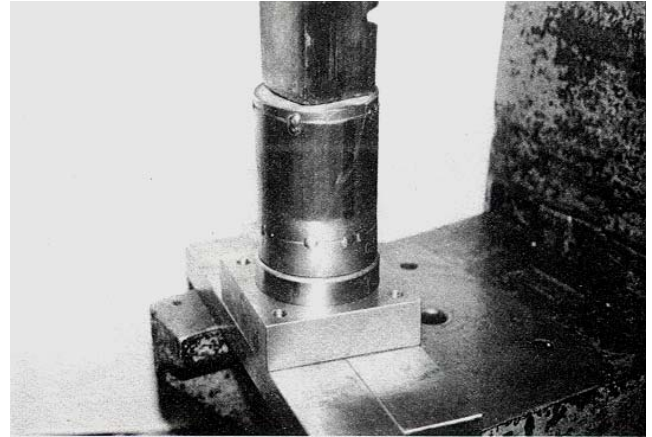


FIGURE 42

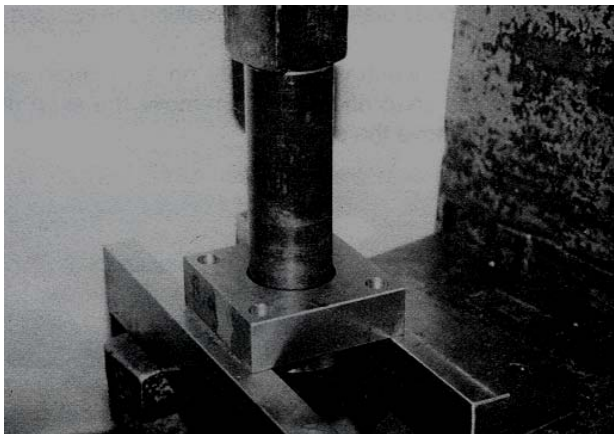


FIGURE 41

9) Position the bearing block on the arbor press with the bearing facing up. Support the inner race of the bearing with an appropriate sized bushing to absorb the thrust created by pressing the driveshaft into the bearing. FIGURE 43.

10) Clean the bearing journal area of the driveshaft with a suitable solvent. Apply a suitable amount of anaerobic adhesive/sealant to the bearing journal area of the driveshaft. Press the driveshaft into the bearing housing until it seats against the bearing. FIGURE 44.

11) Reinstall the snap ring on the driveshaft.

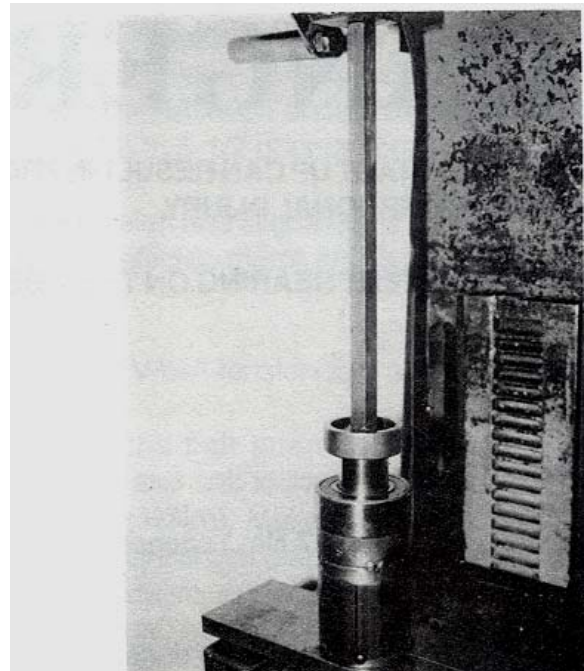


FIGURE 43

ASSEMBLY INSTRUCTIONS/OPERATIONS

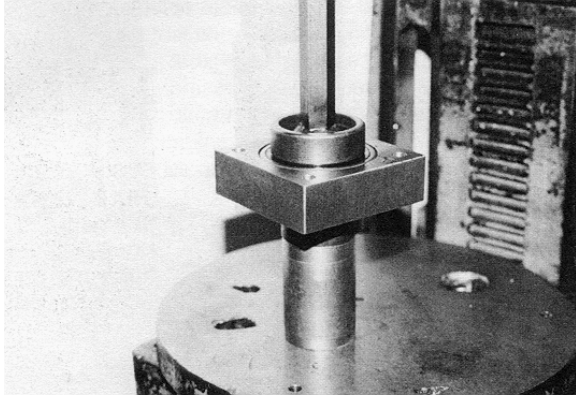


FIGURE 44

10) Mount the bearing block/driveshaft assembly to the main frame. Tighten the 3/8 inch self-locking hex nuts with the torque wrench to 35 ft lbs (47 Nm.)

11) Follow the instructions as outlined for **INSTALLING A REPLACEMENT-BELT OR PULLEY** to complete the assembly of the pulleys, V-belt and belt guard.

A properly installed, replacement bearing should rotate without excessive friction, drag and/or "rough spots". If these symptoms occur after assembly, the bearing was improperly supported when pressed on the driveshaft or into the housing. The resulting thrust placed upon the bearing exceeded its static capacity. A bearing operating with these characteristics will deliver minimal service life and be prone to premature failure.

12) If the Floor Planer is powered by an engine, reconnect the engine spark plug wire. If powered by an electric motor and the machine is to be used immediately, reconnect the extension cord or Surface Grinder to the power source. Determine that the ON/OFF switch located on the operator handle is in the OFF position.

⚠ DANGER

UNEXPECTED MACHINE START UP CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

INSTALLING A REPLACEMENT BEARING ON THE OUTBOARD SIDE.

Application: All Models.

Tools Required:

1 each, 5/16 wrench.

1 each, 3/4 wrench.

1 each, 5/16 Allen wrench.

1 each, arbor press.

1 each, torque wrench, 85 ft lbs (115 Nm.) capacity, with 5/15 inch, male Allen head and 9/16 socket.

1 each, pliers for large, external type snap rings.

Parts Required:

1 each, 29020-016 bearing.

1 each, 29020-015 snap ring (if required).

1) If the Floor Planer is powered by an engine, disconnect the spark plug wire. If powered by an electric motor, disconnect the extension cord or Floor Planer from the power source.

2) Position the Floor Planer on a suitable work surface with the V-belt approximately at waist height.

3) Using a 3/4 inch wrench, remove the access plate capscrews. Remove the access plate.

4) Using the 5/16 inch Allen wrench and 9/16 inch wrench, remove the bearing block from the access plate. For accuracy and alignment purposes, the access plate incorporates tapped holes to properly position the capscrews.

5) Position the bearing block on a suitable work surface. A common shop vise can also be utilized. Remove the snap ring that retains the bushing in the bearing bore. FIGURE 45.

6) Position the bearing block on the arbor press with the bearing facing up. Determine that the bearing block is properly supported. Using the arbor press and an appropriate sized thrust bushing, remove the internal hexagon bushing from the bearing. FIGURE 46.

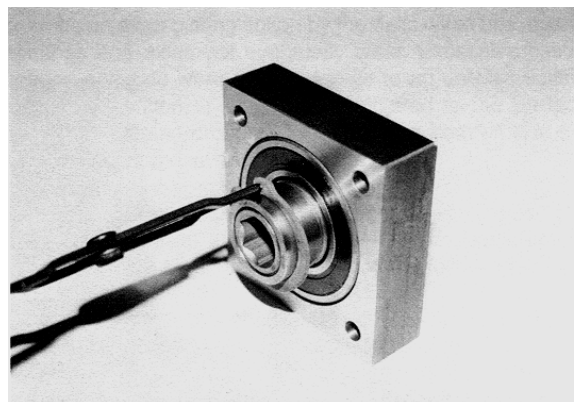


FIGURE 45

ASSEMBLY INSTRUCTIONS/OPERATIONS

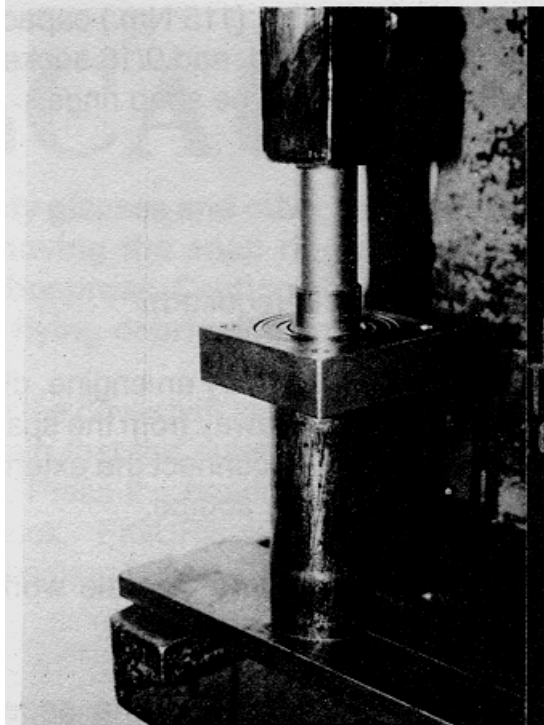


FIGURE 46

7) Clean and inspect the internal hexagon bushing for damage and excessive wear. Replace the bushing if required.

8) Position the bearing block on the arbor press with the bearing facing down. Determine that the bearing block is properly supported. Using the arbor press and an appropriate sized thrust bushing, remove the bearing from the block. FIGURE 47.

9) Clean the inside bore diameter of the bearing block and inspect for damage.

10) Clean the outside diameter of the replacement bearing. Apply a suitable amount of anaerobic adhesive/sealant to the outside diameter of the bearing. Align and press the replacement bearing into the bearing housing until it seats itself against the flange. FIGURE 48.

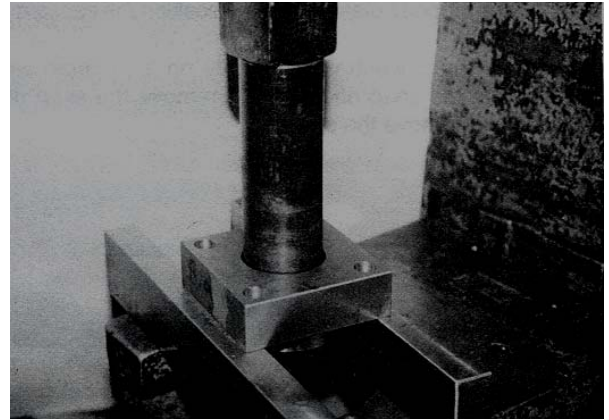


FIGURE 47

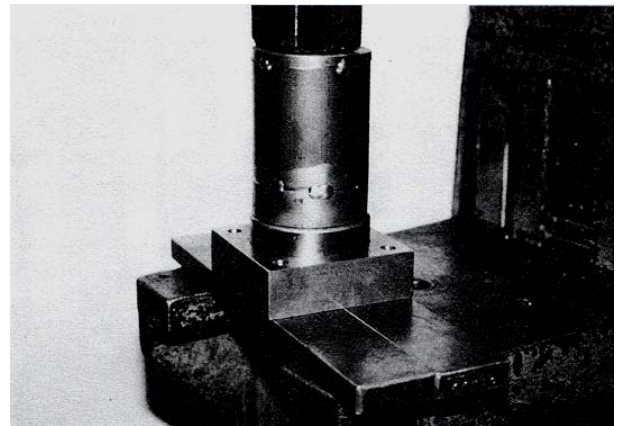


FIGURE 48

11) Position the bearing block with the bearing facing down. Determine that the bearing block and replacement bearing are both properly supported. Using the arbor press, align and press the internal hexagon bushing into the bearing block until it seats itself against the flange. FIGURE 49.

12) Reinstall the snap ring on the internal hexagon bushing.

! CAUTION

Wear safety glasses and other appropriate apparel when removing/installing the snap ring or performing any work with an arbor press. Caution all onlookers about the possibility of flying debris and personal injury.

ASSEMBLY INSTRUCTIONS/OPERATIONS

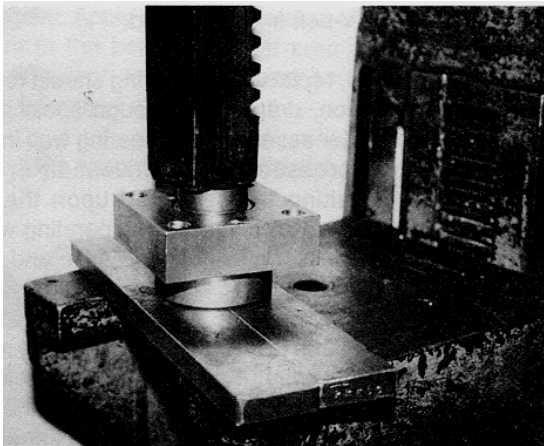


FIGURE 49

13) Mount the bearing block to the access plate. Tighten the 3/8 inch self locking hexagon nuts with the torque wrench to 35 ft lbs (47Nm.).

14) Install the access plate to the main frame by aligning the dowel pins and installing the capscrews and washers. Tighten with the 3/4 inch wrench.

A properly installed replacement bearing should rotate without excessive friction, drag and/or "rough spots". If these symptoms occur after assembly, the bearing was improperly supported when presses into the bearing block. The resulting thrust placed upon the bearing exceeded its static capacity. A bearing operating with these characteristics will deliver minimal service life and be prone to premature failure.

15) If the Floor Planer is powered by an engine, reconnect the engine spark plug wire. If powered by an electric motor and the machine is to be used immediately, reconnect the extension cord or Floor Planer to the power source. Determine that the ON/OFF switch located on the operator handle is in the OFF position.

! DANGER

UNEXPECTED MACHINE START UP CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

LUBRICATION REQUIREMENTS.

Application: All Models.

Parts Required:

1 each, container of dry film lubricant.

1) Lubricate the caster wheel bearings with a dry film lubricant only. Dry film lubricants dry immediately upon contact. Use sparingly. Excess lubricant will attract the fine grained, powdered materials described and directly affect bearing service life.

! CAUTION

Do not lubricate the caster wheels with any type of grease material. Grease will attract foreign material accumulations that can accelerate bearing wear.

2) The flail drum driveshaft is supported by extra capacity, double row ball bearings. Both bearings are of a sealed design and should not require additional lubrication during their normal service life. The grease type and amount utilized for the bearings are intended to provide proper lubrication for the respective loads and operational speeds. Replacement bearings should contain approximately 30 percent fill capacity. Excessive amounts of grease in the bearing cavity can actually increase friction and resulting heat increases can also dramatically shorten bearing service life.

3) The hand crank bearing is sealed and should not require additional lubrication during its normal service life.

4) Do not apply belt dressing materials to the V-belt for the purpose of minimizing slippage. These products typically attract foreign material accumulations that can accelerate component wear. Excessive V-belt slippage can be eliminated with proper V-belt tension and alignment.

5) Loosen the rubber boot to expose the hand crank screw threads. Lubricate the threads with dry film lubricant on a regular, scheduled basis. Clean and remove all material accumulations around the threaded area before applying the lubricant. Do not lubricate the threads with any type of grease material. Grease will attract foreign material accumulations that can accelerate component wear. Place the rubber boot in its original location and tighten the retaining clamp.

! CAUTION

Do not operate the Floor Planer without the protective rubber boot in its intended location. Operation without the rubber boot or a boot in an improper position will accelerate component wear by allowing materials to accumulate in the screw thread area of the crank handle.

ASSEMBLY INSTRUCTIONS/OPERATIONS

ALIGNING THE CASTER WHEELS.

Application: All Models.

Tools Required:

- 1 each, 16 inch minimum length straightedge
- 2 each, 3/4 inch wrenches
- 1 each, torque wrench, 85 ft lbs (115 Nm.) capacity with 3/4 inch socket.
- 1 each, 6 inch scale.

Proper front and rear caster wheel alignment is essential to produce an even cutting action by the flails. With use, caster bearings and axles will eventually wear. Excessive caster bearing and axle wear can contribute to an uneven cutting action. In addition, a sharp blow delivered to the Floor Planer (eg; being dropped to the surface from off a truck) can also affect the caster wheel alignment.

Caster wheels are aligned during assembly with the use of a specially designed alignment jig. However, satisfactory results can also be achieved in the field by following steps:

1) Position the Floor Planer on a suitable work surface. If the Floor Planer is powered by an engine and the engine is not to be removed, fuel and oil must be first drained from the fuel tank and crankcase. If powered by an electric motor, disconnect the extension cord or Floor Planer from the power source. The normal position for aligning the caster wheels is with the main frame perpendicular to the work surface. Support the unit with proper blocking.

2) Shim washers of .015 inch (.381 mm) thickness are sometimes utilized when fastening the front axle assembly to the main frame. Install washers as required. FIGURE 50. The fasteners that attach the front axle assembly should be tightened until slight tension is applied. Always position the 1/2 inch flat washers against the slots provided in the axle assembly.



FIGURE 50

3) Position the front casters so that their faces extend approximately 7/16 inch (11.1 mm) beyond the bottom surface of the main frame. Caster wheels have a slight curvature on their faces. The measurement should be taken at the high point of the curvature. FIGURE 51.

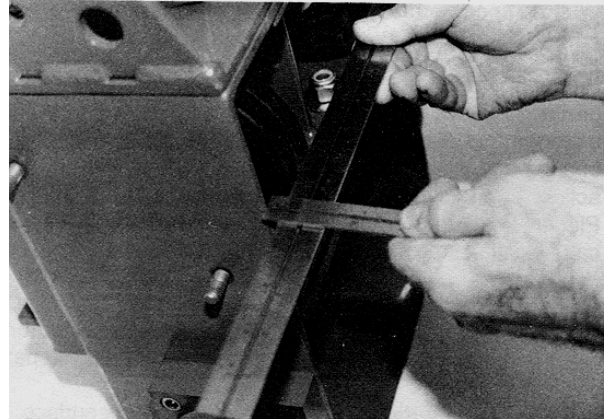


FIGURE 51

4) Push the rear casters towards the main frame until the upper limit stop is encountered. FIGURE 52.

5) Place the straightedge between the front and rear casters on the high point of the face curvature. Adjust the front casters so that the gap between the straightedge and the bottom of the main frame is identical. This gap figure is approximately 1/8 to 1/4 inch (3.17 to 6.35 mm). It is important that the straightedge be positioned on both sets of casters in the same relative position on the caster faces. FIGURE 53.

6) Tighten the fasteners with the torque wrench to 85 ft lbs (115 Nm.). The addition of clamps will minimize any movement or location change while tightening the fasteners.



FIGURE 52

ASSEMBLY INSTRUCTIONS/OPERATIONS

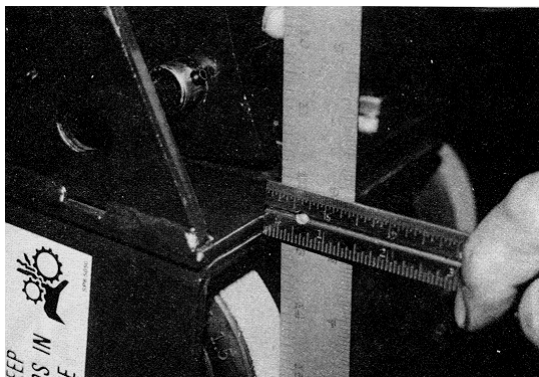


FIGURE 53

7) Repeat Step 5 to determine that alignment did not change while tightening the fasteners. If alignment did change, repeat Steps 2 thru 6 until satisfactory results have been achieved.

CHECKING DRIVESHAFT RUN OUT.

Application: All Models.

Tools Required:

- 1 each, 3/4 inch wrench.
- 1 each, dial indicator and magnetic base.

Parts Required:

- 1 each, PN 29020-015 driveshaft (if required).

Proper driveshaft run out limits are essential to produce an even cutting action by the flails. Driveshaft run out limits are measured with the use of a dial indicator for accuracy.

- 1) Position the Floor Planer on a suitable work surface. If the engine is not to be removed, fuel and oil must be drained from the fuel tank and crankcase. The normal position for checking driveshaft run out is with the main frame perpendicular to the work surface. Support the unit with proper blocking.
- 2) Using the 3/4 inch wrench, remove the capscrews that retain the access door to the main frame.
- 3) Clean and remove any excessive material build-up from the threaded bosses and surrounding area. Material build-up can affect the driveshaft run out.
- 4) Remove the flail drum and replace the access door. Tighten the capscrews with the wrench until the access door is secured.
- 5) Install the dial indicator with the magnetic base attached to the main frame. Driveshaft run out can be measured by the dial indicator at two locations:

- a) Position the dial indicator to measure run out on the

driveshaft flange. Maximum run out (as measured by the dial indicator gauge) is $\pm .010$ inches (.254 mm). A worn flange surface may not allow an accurate measurement to be taken. FIGURE 54.

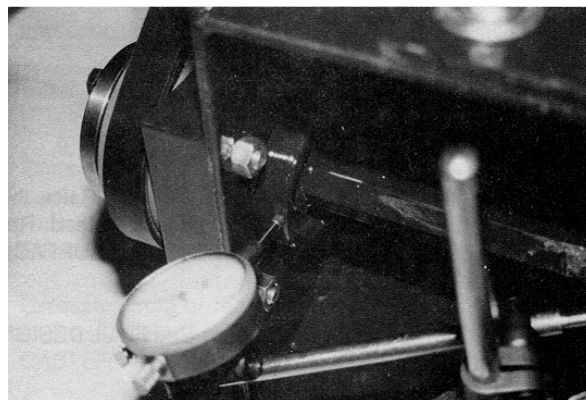


FIGURE 54

b) Position the dial indicator to measure run out on the internal hexagon bushing of the outboard bearing. Maximum run out (as measured by the dial indicator gauge) is $\pm .015$ inches (.381 mm). FIGURE 55.



FIGURE 55

6) Run out measurements that exceed these limits may suggest that the driveshaft is bent. A bent driveshaft will accelerate bearing wear and failure while contributing to uneven flail cutting action. Under certain circumstances, a bent driveshaft can be removed and straightened in an arbor press. See the SERVICE section for specific information pertaining to replacing the driveshaft. If the straightened driveshaft still exceeds the established run out limits after re-assembly, it must be replaced with a factory approved, replacement part.

ELECTRIC MOTOR SERVICE.

Application: 8FP/E Series Floor Planer.

The electric motor is capable of operating for many years with a reasonably small amount of maintenance. Before attempting to service the motor, disconnect the Floor Planer from the power source. Clean the motor surfaces periodically, preferably with a vacuum cleaner. Heavy accumulations of dirt and lint will result in overheating and premature failure of the motor.

The electric motor is equipped with higher capacity ball bearings and under normal service and ambient temperatures, should not require relubrication for many years. If you feel that the motor requires relubrication, contact the local representative of the motor manufacturer for specific information.

The seals utilized with the motor are intended to deliver a longer service life in a concrete dust environment. When replacing the seals, utilize only components meeting the original factory specifications.

ENGINE SERVICE.

Application: 8FP/G Series Floor Planer.

Consult the material supplied by the engine manufacturer for specific service and maintenance information regarding:

- 1) Muffler
- 2) Spark Plug
- 3) Air Filter System
- 4) Carburetor Adjustment
- 5) Ignition System
- 6) Short and Long Term Storage
- 7) Maximum Governed Engine Speed
- 8) Emission Standards

Keep this information stored with the Operator's Manual for the Floor Planer so it will always be available for use when the engine requires service or maintenance. A properly maintained engine will add considerably to the service life and overall productivity of the Floor Planer.

CAUTION

Because the planing process produces high levels of random vibration, it is essential that the maximum governed engine speed be checked at regular, established intervals. Excessive engine speed can produce vibration induced forces that can dramatically affect component service life. Stress related cracking and resulting failure to mufflers, blower shrouds, belt guards and other components can result from excessive engine speed.

Troubleshooting

ELECTRIC MOTOR.

Application: 8FP/E Series Floor Planer.

MOTOR FAILS TO START

ON/OFF switch in the OFF position. Turn the switch to the ON position.

Improper voltage selection. Determine the available voltage value from the power source. Move the voltage selection switch located on the motor to the proper selection.

Floor Planer and/or extension cord is not plugged into the power source. Determine that all electrical connections have been properly made. The NEMA 6-20 Series cap and receptacle set is of a twist lock configuration and requires a twist motion to ensure a proper connection.

Improper extension cord size and capacity. Operate the Floor Planer with copper stranded, 8 AWG or larger extension cords. Improper extension cord size and capacity will result in significant heat rise and corresponding voltage and amperage drop.

Thermal protection device activated. To protect the motor against heat related damage, an automatic thermal protection switch is provided near the voltage selection switch. High operating temperatures will activate the switch and shut the motor off. After the motor has cooled to an acceptable temperature level, depress the switch to restart.

MOTOR LOSES POWER

Improper extension cord size and capacity. Replace with cords meeting the required specifications.

Excessive extension cord length. Even with proper extension cord size and capacity, excessive cord length can reduce the available voltage and amperage to the motor. Measure the Available voltage to the motor where the extension cord connects to the Floor Planer with a voltmeter. Reduce the extension cord length as required to achieve the minimum voltage operating specification as required by the motor manufacturer.

Insufficient available voltage and amperage at the power source. Measure the available voltage at the power source (usually a receptacle) with a voltmeter. If the available voltage is below the minimum operating specification as required by the motor manufacturer, utilize an alternative power source.

Improper motor cooling. See ELECTRIC MOTOR SERVICE.

Excessive load to the motor. See OPERATING THE FLOOR PLANER ON THE JOBSITE.

ENGINE.

Application: 8FP/G Series Floor Planer.

ENGINE FAILS TO START

Ignition switch in OFF or cut off position. Place switch in the ON position or move throttle control lever to the ignition operational position.

Incorrect carburetor/fuel injection system adjustment. See SERVICE section.

Air filter blocked. See SERVICE section.

Ignition wire to spark plug loose or disconnected. Reconnect.

Fuel supply exhausted. Refill the fuel tank.

ENGINE LOSES POWER

Incorrect carburetor/fuel injection adjustment. See SERVICE section.

Water in fuel supply. Drain and replace fuel.

Excessive carbon accumulation in combustion chamber. See SERVICE section.

Fuel tank breather vent closed (if so equipped). Open vent.

Air filter blocked. See SERVICE section.

OPERATIONAL PROBLEMS.

Application: All Models.

UNEVEN FLAIL WEAR

Excessive cutting depth for the feed/travel rate. Raise the flail drum and make multiple, shallow passes instead. Reduce the feed/travel rate. See OPERATING THE FLOOR PLANER ON THE JOB SITE.

Improper flail and spacer washer setup. See FLAIL DESIGN AND APPLICATION.

Accumulation of foreign material. Clean and/or replace the flails and spacer washers as necessary.

Flails and/or spacer washers are too tight on the drum. Remove and/or replace flails and spacer washers. See FLAIL DRUM RODS.

EXCESSIVE JUMPING ON THE WORK SURFACE

Excessive cutting depth for the feed/travel rate. Raise the flail drum and make multiple, shallow passes instead. Reduce the feed/travel rate. See OPERATING THE FLOOR PLANER ON THE JOB SITE.

Engine/Flail RPM too low. Reset engine speed. See OPERATING THE FLOOR PLANER ON THE JOB SITE.

ACCELERATED V-BELT WEAR

Misaligned and/or improperly tensioned pulleys. Readjust pulleys and V-belt. See SERVICE section.

Worn pulleys. Replace pulleys as required. See INSTALLING A REPLACEMENT V-BELT OR PULLEY.

Improper V-Belt. Replace with a P/N 29020-056 3VX335 V-belt or equivalent. See INSTALLING A REPLACEMENT V-BELT OR PULLEY.
Bent driveshaft. See CHECKING DRIVESHAFT RUN OUT.

V-belt rubbing on the work surface. Inspect the belt guard bumper for wear. Repair or replace the guard as necessary. Readjust cutting height. Remove excess loose material from the work surface. See OPERATING THE FLOOR PLANER ON THE JOB SITE.

ACCELERATED BEARING WEAR AND/OR FAILURE

Misaligned and/or improperly tensioned pulleys. Readjust pulleys and V-belt. See SERVICE section.

Bent driveshaft. See CHECKING DRIVESHAFT RUN OUT.

Improper lubrication. See LUBRICATION REQUIREMENTS.

UNEVEN CUTTING ACTION

Excessive material build-up on the wheel face surfaces. Remove the material.

Excessive caster wheel bearing wear. Replace the caster.

Excessive front or rear axle wear. Replace the appropriate axle assembly. See ALIGNING THE FRONT AND REAR CASTER WHEELS.

Front and rear caster wheels are not properly aligned. See ALIGNING THE FRONT AND REAR CASTER WHEELS.

Flails and/or spacer washers are too tight on the drum. Remove and/or replace flails and spacer washers. See FLAIL DRUM RODS.

Mixing new and worn flails. Remove and replace with flails of the same, approximate diameter. See FLAIL DRUM RODS.

Storage

Application: All Models.

Proper procedure for long term storage of the Floor Planer will protect it against the effects of corrosion and damage. If the Floor Planer is not to be operated for a period of 30 days or more, proceed to store as follows:

1) Clean all accumulated foreign material from the Floor Planer utilizing an appropriate solvent.

⚠ CAUTION

Observe all applicable safety precautions for the solvent.

2) Follow the procedure as outlined in the material supplied by the engine manufacturer describing long term storage for the engine.

3) Check all visible parts for wear, breakage or damage. Order any part required to make the necessary repair. This will avoid a needless delay when operating the Floor Planer at next use.

4) Apply a dry film lubricant to all exposed metal components to prevent the formation of rust.

5) Store the Floor Planer inside. If the Floor Planer must be stored outside, protect it with a suitable covering.

Specifications

FRAME

STRUCTURE.....	Unitized, Welded Steel Plate
DRIVE REDUCTION SYSTEM	3VX335 Belt/Pulley
DRIVESHAFT SIZE AND CONFIGURATION.....	13/16-inch (21 mm) hexagon
MAXIMUM CUTTING DEPTH.....	5/8-inch (16 mm)
MAXIMUM CUTTING WIDTH	8-inches (203 mm)
MAXIMUM MACHINE LENGTH.....	43-1/4-inches (1099 mm)
MAXIMUM OPERATOR HANDLE HEIGHT.....	38-3/8-inches (975 mm)
OVERALL MACHINE WIDTH.....	16-1/8-inches (410 mm)
CUTTING PROXIMITY TO LATERAL BORDER	3-1/4-inches (83 mm) without edger attachment
VACUUM CLEANER CONNECTION.....	1-1/2 or 3-inch (38 or 76 mm) outside diameter.

GENERAL

8FP/E BASIC WEIGHT 155 lbs (71 kg), less drum and flails.

8FP/G BASIC WEIGHT 160 lbs (73 kg), less drum and flails.

MAXIMUM GOVERNED ENGINE..... 3450 RPM

SPEED FOR 5 HP CATEGORY,
4 CYCLE, HONDA GX160 GASOLINE ENGINE

8FP/E ELECTRIC MOTOR 5.0 Hp, 3450 RPM, 21 amperes full load @ 230 VAC, 60 Hz, 23 amperes full load @ 220 VAC, 50 Hz or The electric motor requires a clean (no other electric products on the same circuit) capacity 10 ampere capacity circuit to properly function at 230 VAC, 60 Hz.

EXPLANATION OF CODE IN REMARKS COLUMN

The following section explains the different symbols and remarks used in the Parts section of this manual. Use the help numbers found on the back page of the manual if there are any questions.

NOTICE

The contents and part numbers listed in the parts section are subject to change **without notice**. Multiquip does not guarantee the availability of the parts listed.

SAMPLE PARTS LIST

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	12345	BOLT	1	INCLUDES ITEMS W/%
2%		WASHER, 1/4 IN.		NOT SOLD SEPARATELY
2%	12347	WASHER, 3/8 IN. ..1		MQ-45T ONLY
3	12348	HOSE		A/R ...MAKE LOCALLY
4	12349	BEARING	1	S/N 2345B AND ABOVE

NO. Column

Unique Symbols — All items with same unique symbol

(@, #, +, %, or >) in the number column belong to the same assembly or kit, which is indicated by a note in the “Remarks” column.

Duplicate Item Numbers — Duplicate numbers indicate multiple part numbers, which are in effect for the same general item, such as different size saw blade guards in use or a part that has been updated on newer versions of the same machine.

NOTICE

When ordering a part that has more than one item number listed, check the remarks column for help in determining the proper part to order.

PART NO. Column

Numbers Used — Part numbers can be indicated by a number, a blank entry, or TBD.

TBD (To Be Determined) is generally used to show a part that has not been assigned a formal part number at the time of publication.

A blank entry generally indicates that the item is not sold separately or is not sold by Multiquip. Other entries will be clarified in the “Remarks” Column.

QTY. Column

Numbers Used — Item quantity can be indicated by a number, a blank entry, or A/R.

A/R (As Required) is generally used for hoses or other parts that are sold in bulk and cut to length.

A blank entry generally indicates that the item is not sold separately. Other entries will be clarified in the “Remarks” Column.

REMARKS Column

Some of the most common notes found in the “Remarks” Column are listed below. Other additional notes needed to describe the item can also be shown.

Assembly/Kit — All items on the parts list with the same unique symbol will be included when this item is purchased.

Indicated by:

“INCLUDES ITEMS W/(unique symbol)”

Serial Number Break — Used to list an effective serial number range where a particular part is used.

Indicated by:

“S/N XXXXX AND BELOW”

“S/N XXXX AND ABOVE”

“S/N XXXX TO S/N XXX”

Specific Model Number Use — Indicates that the part is used only with the specific model number or model number variant listed. It can also be used to show a part is NOT used on a specific model or model number variant.

Indicated by:

“XXXXX ONLY”

“NOT USED ON XXXX”

“Make/Obtain Locally” — Indicates that the part can be purchased at any hardware shop or made out of available items. Examples include battery cables, shims, and certain washers and nuts.

“Not Sold Separately” — Indicates that an item cannot be purchased as a separate item and is either part of an assembly/kit that can be purchased, or is not available for sale through Multiquip.

SUGGESTED SPARE PARTS

8FP FLOOR PLANER SERIES 1 TO 3 UNIT

Gasoline Model Honda GX160KQXC9

Qty.	P/N	Description
1	SP8-0600	HOSE, GREASE
1	CS80350	SWITCH ASSY., ON/OFF
1	29020-031	KNOB, HANDLE
3	29020-056	V-BELT
3	17210ZE1517	ELEMENT AIR CLEANER
3	9807956846	SPARK PLUG
1	17620ZH7023	CAP, FUEL TANK
1	28462ZH8003	ROPE RECOIL

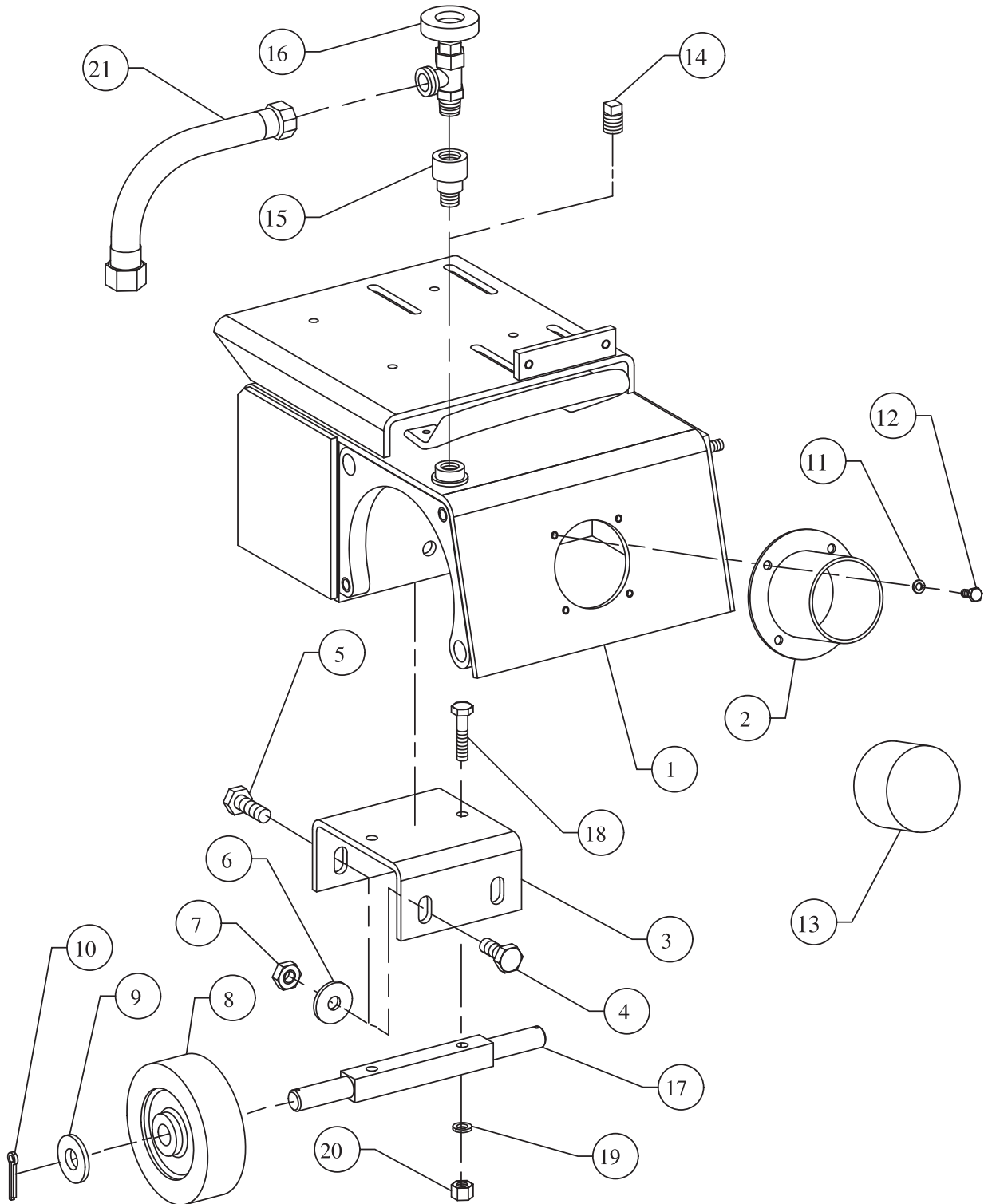
8FP FLOOR PLANER SERIES 1 TO 3 UNIT

Electric Model

Qty.	P/N	Description
1	SP8-0600	HOSE, GREASE
1	29018-044	SWITCH ASSY., ON/OFF
1	29020-031	KNOB, HANDLE
1	29018-041	CORD, ELECTRIC SHORT 12'
1	29020-054	CORD ELECTRIC LONG
1	08885-014	RECEPTACLE, FEMALE 60 HZ.
3	29020-056	V-BELT

MAIN FRAME ASSEMBLY

MAIN FRAME ASSY.



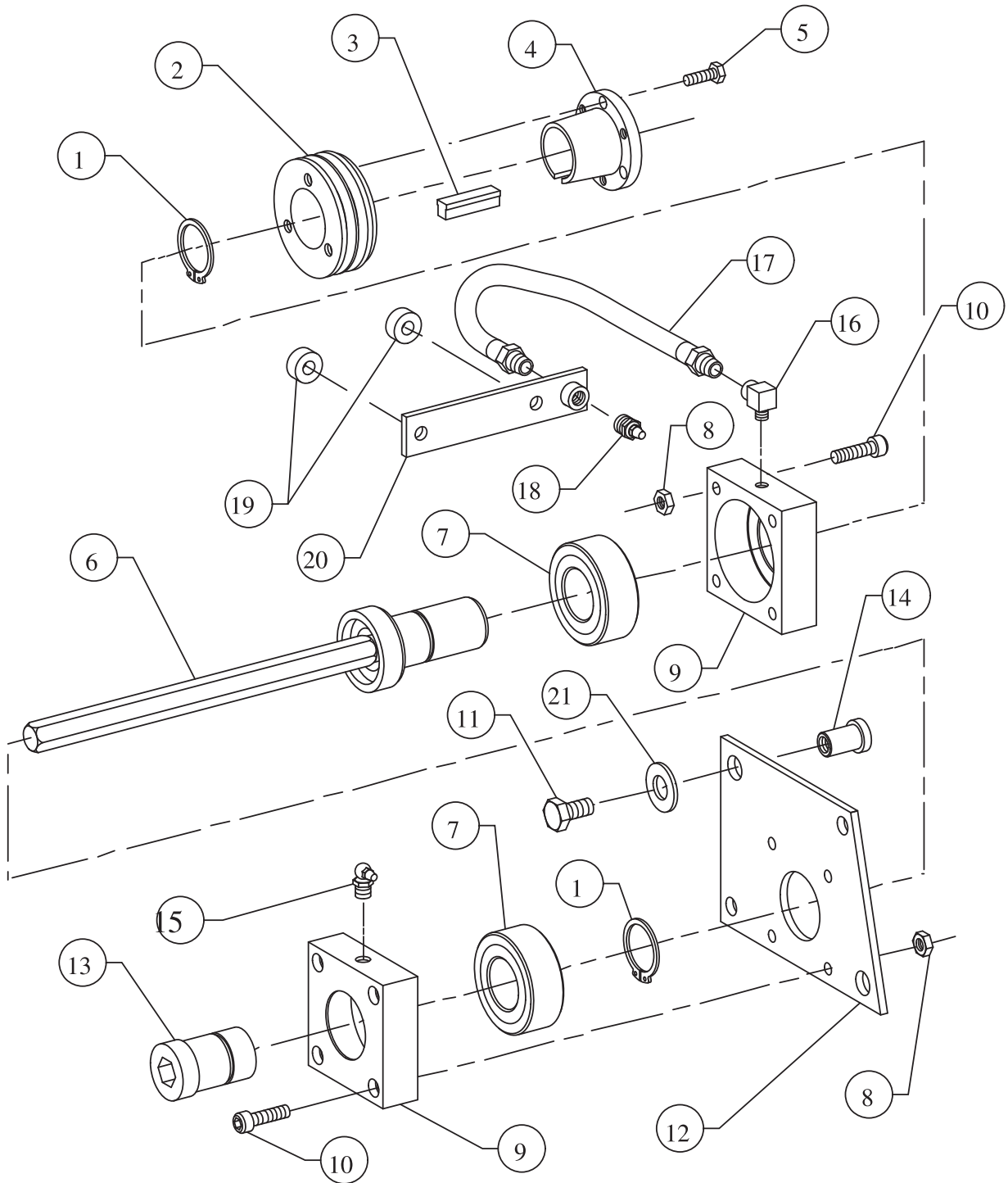
MAIN FRAME ASSEMBLY

MAIN FRAME ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-001	FRAME, MAIN	1	
2	29020-002	TUBE, VACUUM	1	
3	SP8-0061	AXLE MOUNT	1	
4	06503-010	SCREW, CAP 1/2-1-1/4" UNC PLATED GRADE 5	2	
5	06503-012	SCREW, CAP 1/2-1-1/2" UNC PLATED GRADE 5	2	
6	07030-008	WASHER, FLAT 1/2" PLATED	4	
7	08233-008	NUT, HEXAGON 1/2" UNC SELF-LOCKING PLATED	4	
8	29020-004	WHEEL, CASTER	2	
9	07030-012	WASHER, FLAT 3/4" PLATED	2	
10	07028-057	PIN, COTTER 5/32" X 1-1/2" PLATED	2	
11	07029-004	WASHER, LOCK 1/4" PLATED	4	
12	06499-006	SCREW, CAP 1/4" X 3/4" UNC PLATED GRADE 5	4	
13	29020-010	CAP, DUST COVER	1	
14	29020-009	PLUG, PIPE 1/4" NPTF SQUARE	1	
15	29020-008	FITTING, REDUCING, DO NOT USE.....	1OPTION
16	29020-007	VALVE DO NOT	1OPTION
17	SP8-0370	AXLE	1	
18	06501-012	HHCS, 3/8"-16 X 1-1/2" UNC PLATED GRADE 5	2	
19	07029-006	WASHER, LOCK 3/8" PLATED	2	
20	07033-006	LOCKNUT, HEXAGON 3/8"-16 UNC PLATED	2	
21	CS8-0900	HOSE, JUMPER	1OPTION

DRIVESHAFT ASSEMBLY

DRIVESHAFT ASSY.



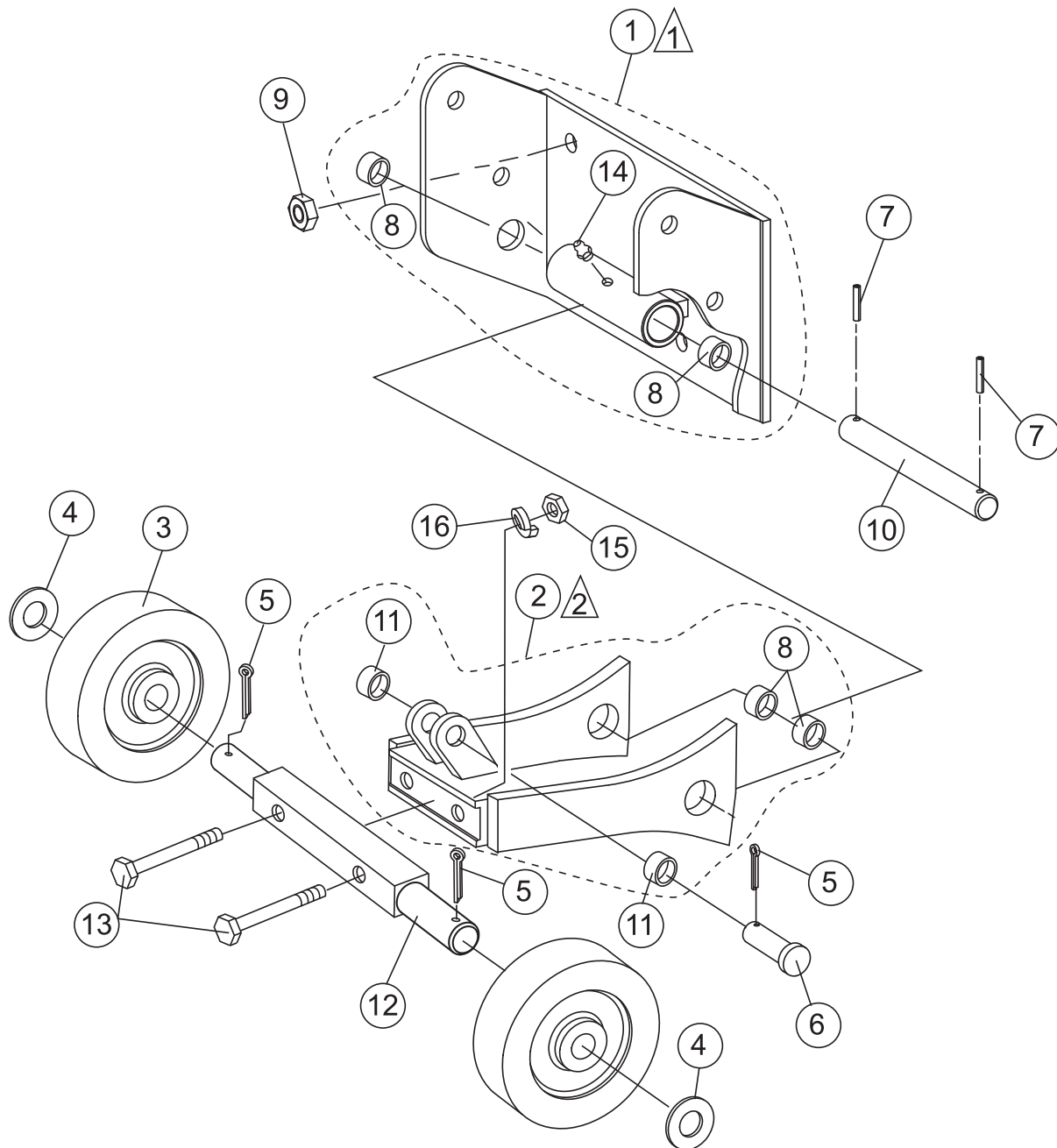
DRIVESHAFT ASSEMBLY

DRIVESHAFT ASSY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-011	RING, RETAINING EXTERNAL	2	
2	29020-012	SHEAVE, DRIVESHAFT	1	
3	29020-013	KEY, SPECIAL	1	
4	29020-014	SHEAVE, CENTER HUB	1	
5	06500-008	SCREW, CAP 5/16-18 NC X 1" PLATED GRADE 5	3	
6	29020-015	DRIVESHAFT	1	
7	29020-016	BEARING, SEALED, 5208-2RS	2	
8	08233-006	NUT, HEX SELF-LOCKING 3/8-16 NC PLATED	8	
9	29020-17	BLOCK, BEARING MOUNTING	2	
10	29020-018	SHCS 3/8-16 X 1-3/8	8	
11	06503-008	HHCS, 1/2" -13 X 1"	4	
12	29020-019	PLATE, MAIN FRAME SIDE	1	
13	29020-020	INSERT, HEX	1	
14	29020-021	BUSHING, DOWEL	2	
15	SP8-0560	FITTING, GREASE 90° X 1/8" NPT	1	
16	SP8-0570	90° STREET ELBOW, 1/8" NPT X 1/8" NPT	1	
17	SP8-0600	HOSE, GREASE	1	
18	SP8-0590	FITTING, GREASE STRAIGHT 1/8" NPT	1	
19	GP8-0090	SPACER	2	
20	SP8-0440	HOSE MOUNT	1	
21	SP8-4000	WASHER, HARDENED	4	

REAR FRAME ASSEMBLY

REAR FRAME ASSY



NOTES:

- ① REAR FRAME MOUNT ASSEMBLY
INCLUDES ITEMS WITHIN DASHED LINES.
- ② REAR AXLE MOUNT ASSEMBLY
INCLUDES ITEMS WITHIN DASHED LINES.

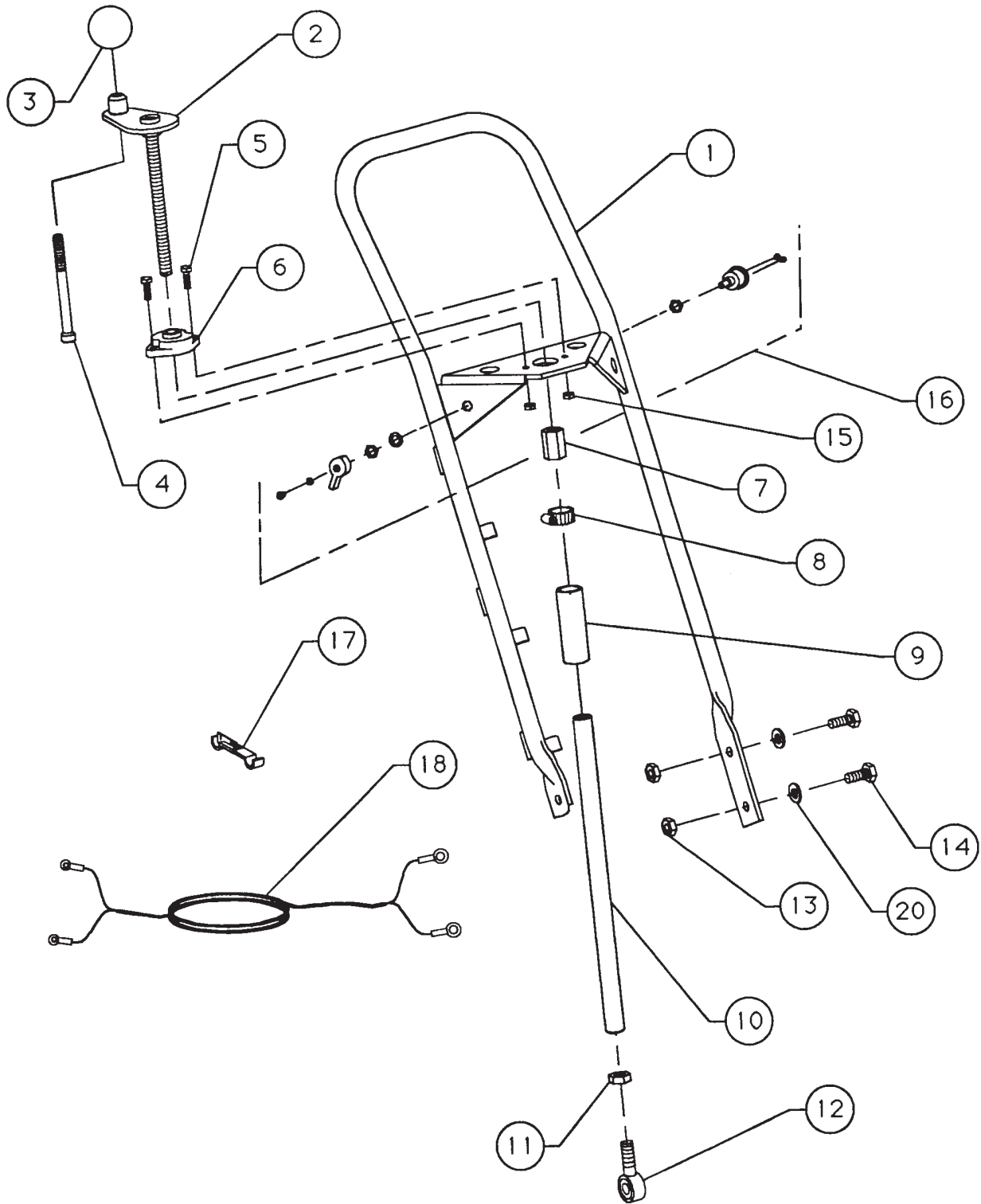
REAR FRAME ASSEMBLY

REAR FRAME ASSY

NO.	PART NO.	PART NAME	QTY.	REMARKS
1	SP8-0091A	REAR FRAME MOUNT ASSEMBLY	1	INCLUDES ITEMS W/#
2	SP8-0111A	REAR AXLE MOUNT ASSEMBLY	1	INCLUDES ITEMS W/\$
3	29020-004	WHEEL, CASTER	2	
4	07030-012	WASHER, FLAT 3/4" PLATED	2	
5	07028-057	PIN, COTTER 5/32" X 1-1/2" PLATED	3	
6	29020-024	PIN, CLEVIS 5/8" X 2-1/4" PLATED	1	
7	290020-025	PIN, ROLL 3/16" X 1" PLATED	2	
8#\$	29020-026	BUSHING, CONNEX	4	
9	208233-008	NUT, HEXAGON 1/2" UNC SELF-LOCKING PLATED	2	
10	29020-027	SHAFT, HINGE PLATED	1	
11\$	SP8-0460	BUSHING, CONNEX	2	
12	SP8-0370	AXLE	1	
13	15063000	SCREW, CAP 3/8" X 3-3/4" UNC PLATED GRADE 5	2	
14#	5500590	FITTING, GREASE	1	
15	07033-006	NUT, HEXAGON 3/8"-16 UNC PLATED	2	
16	07029-006	WASHER, LOCK 3/8" PLATED	2	

OPERATOR HANDLE ASSEMBLY (GASOLINE)

OPERATOR HANDLE ASSY (GASOLINE)



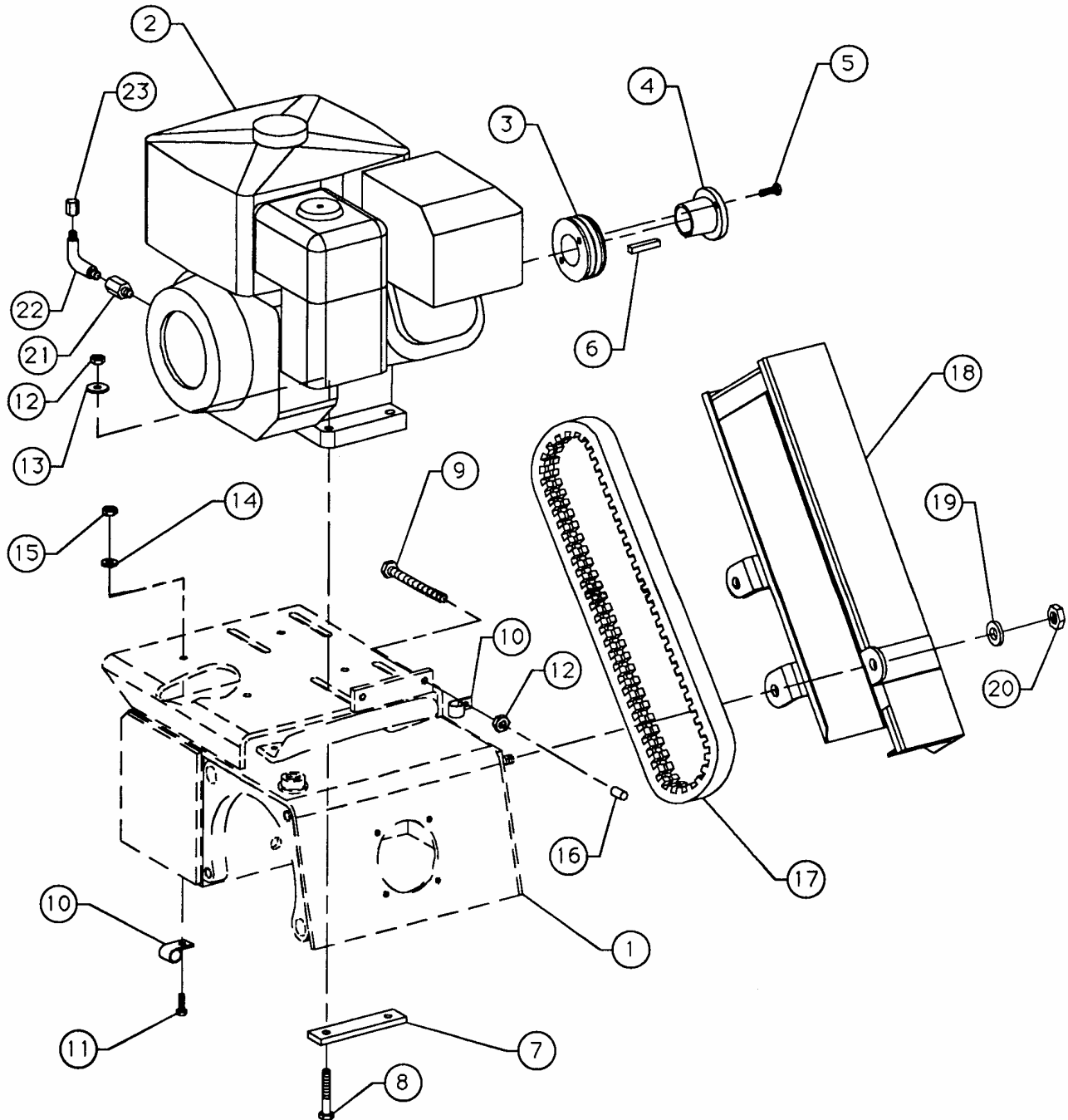
OPERATOR HANDLE ASSEMBLY (GASOLINE)

OPERATOR HANDLE ASSY (GASOLINE)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-028	HANDLE, OPERATOR	1	
2	29020-029	SCREW, CRANK	1	
3	29020-031	KNOB, HANDLE	1	
4	29020-031	SCREW, CAP SPECIAL	1	
5	06500-008	SCREW, CAP 5/16-18 NC X 1", PLATED GRADE 5	2	
6	29020-032	BEARING	1	
7	29020-033	NUT	1	
8	14821-004	CLAMP, HOSE 1-1/4" PLATED	1	
9	29020-034	BOOT, RUBBER	1	
10	29020-035	BARREL, ADJUSTING	1	
11	06922-004	NUT, HEX JAM 5/8" UNF LT HAND THREAD PLATED	1	
12	29020-036	ROD END	1	
13	08233-008	NUT, HEX 1/2"-13 UNC SELF-LOCKING PLATED	4	
14	06503-006	HHCS, 1/2" X 1-1/4" UNC PLATED GRADE 5	4	
15	08233-005	NUT, HEX 5/16"-18 UNC SELF-LOCKING PLATED	2	
16	CS8-0350	SWITCH, SHUT-OFF	1	
17	CS8-0390	T-TAP, 22-18 GAUGE WIRE	1	
18	SP8GH-0370	WIRE LOOM, SHUT-OFF	1	
20	07030-008	WASHER, FLAT 1/2" PLATED	4	

GASOLINE ENGINE ASSEMBLY

GASOLINE ENGINE ASSY



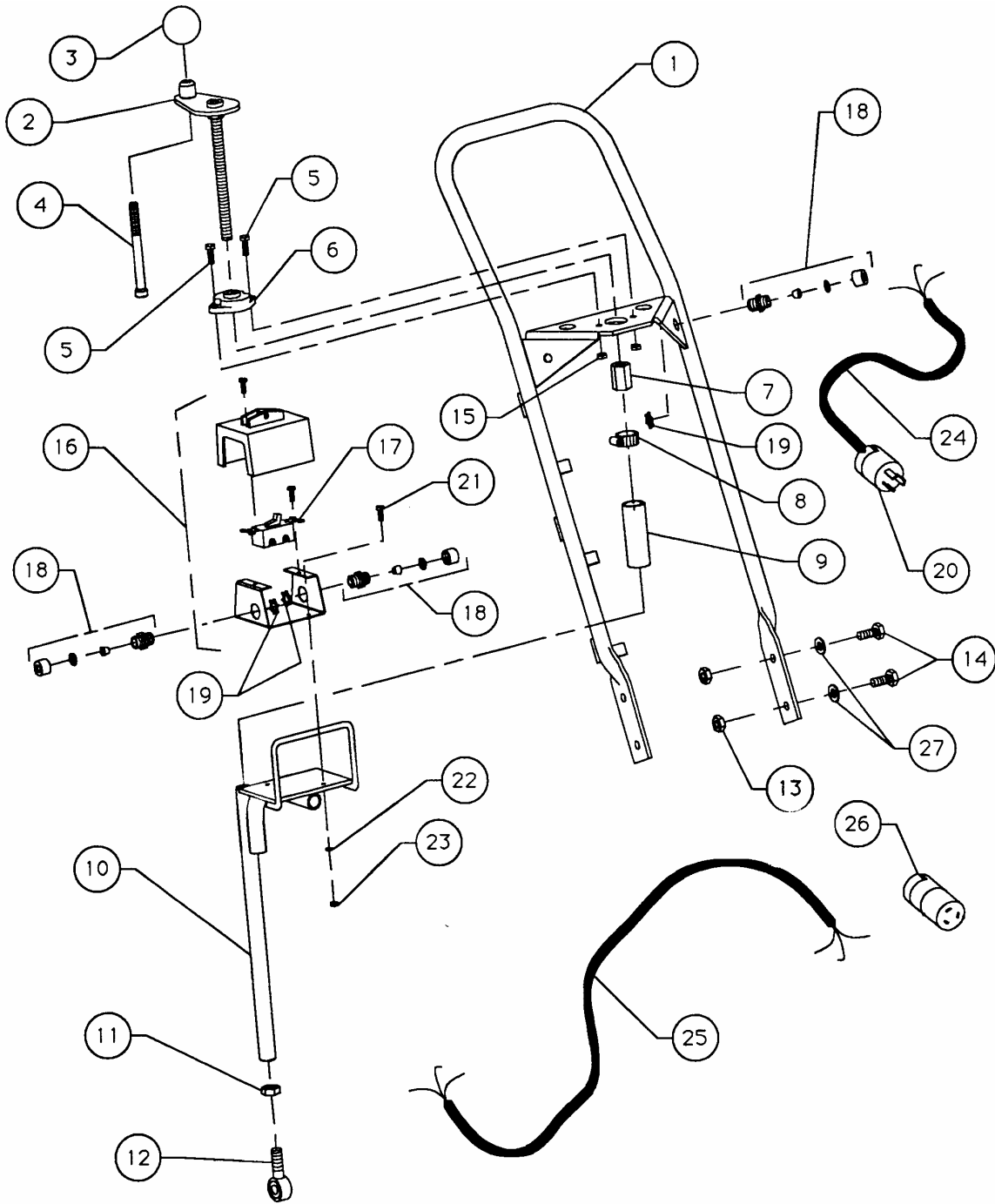
GASOLINE ENGINE ASSEMBLY

GASOLINE ENGINE ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-001	FRAME, MAIN	1	
2	GX160KQXC9	ENGINE, HONDA 5.5HP	1	
3	29020-037	DRIVE PULLEY	1	
4	29020-038	BUSHING, CENTER HUB	1	
5	06499-006	SCREW, CAP 1/4" UNC X 3/4" GRADE 5	2	
6	10057-016	KEY, STANDARD 3/16" X 3/16" X 1-1/2"	1	
7	29020-005	BRACKET, ENGINE MOUNT	2	
8	06500-016	SCREW, CAP 5/16"-18 X 2 UNC X 2" PLATED GRADE 5	4	
9	29020-006	BELT TENSIONING SCREW	2	
10	CV0411	CLAMP, PLATED	2	
11	06499-006	SCREW, CAP 1/4"-20 X 3/4" UNC PLATED GRADE 5	1	
12	07030-005	WASHER, FLAT 5/16" PLATED	4	
13	08233-005	NUT, HEXAGON 5/16" UNC SELF-LOCKING PLATED	6	
14	07029-004	WASHER, LOCK 1/4" PLATED	1	
15	07033-004	NUT, HEXAGON 1/4"-20 UNC PLATED	1	
16	SP8-0380	CAP, PLASTIC	2	
17	29020-056	V-BELT, 3VX335	1	
18	29020-039	BELT GUARD	1	
19	07030-006	WASHER, FLAT 3/8" PLATED	3	
20	08233-006	NUT, HEXAGON 3/8"-16	3	
21	SP8-0400	ADAPTER	1	
22	SP8-0390	HOSE, OIL DRAIN	1	
23	SP8-6600490	CAP, FEMALE 1/4" NPT	1	

OPERATOR HANDLE ASSEMBLY (ELECTRIC)

OPERATOR HANDLE ASSY



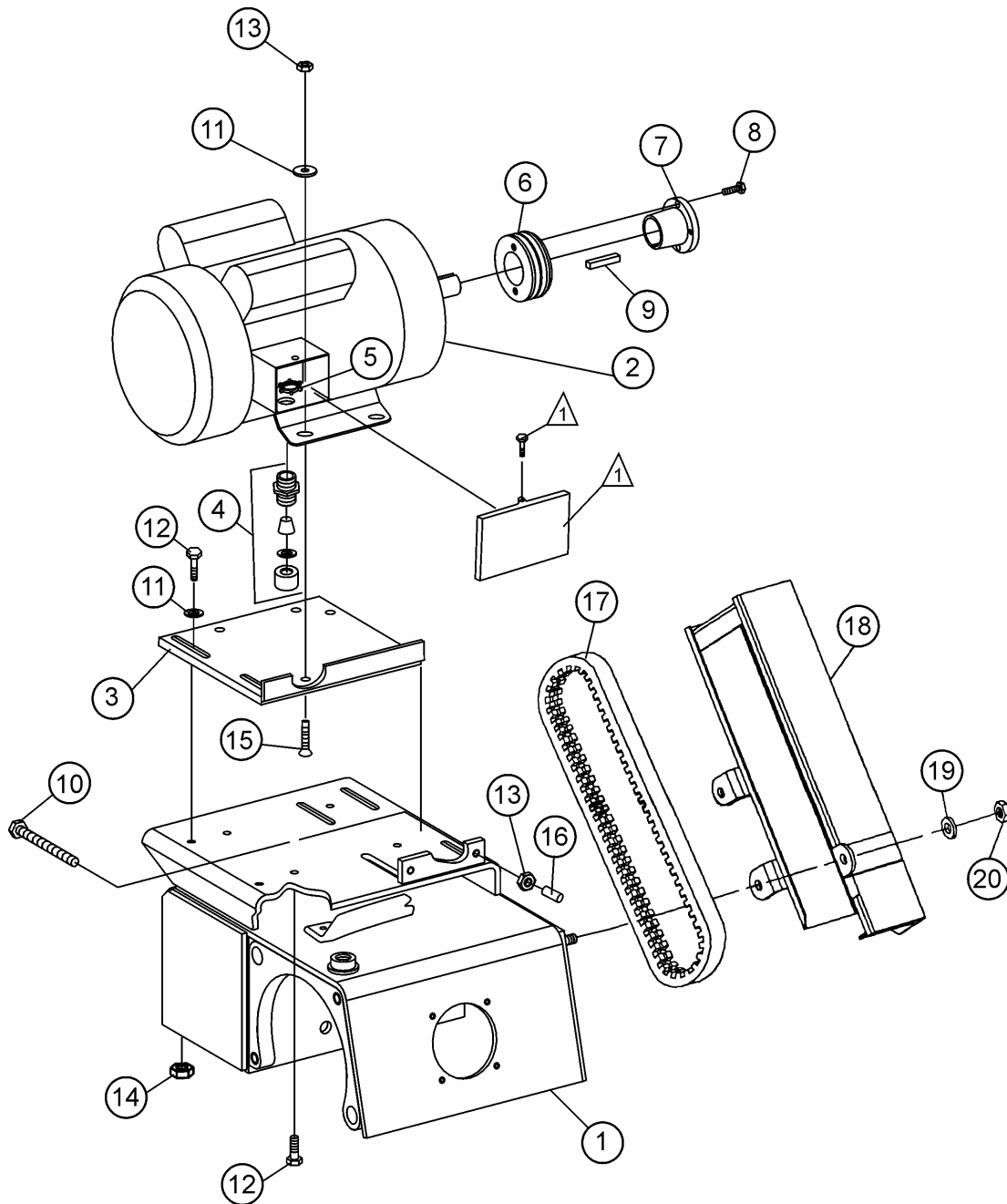
OPERATOR HANDLE ASSEMBLY (ELECTRIC)

OPERATOR HANDLE ASSY (ELECTRIC)

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-028	HANDLE OPERATOR	1	
2	29020-029	SCREW, CRANK	1	
3	29020-031	KNOB, HANDLE	1	
4	29020-031	HEIGHT ADJUSTMENT SCREW	1	
5	06500-008	SCREW, CAP 5/16-18 NC X 1", PLATED GRADE 5	2	
6	29020-032	BEARING	1	
7	29020-033	NUT	1	
8	14821-004	CLAMP, HOSE 1-1/4" PLATED	1	
9	29020-034	BOOT, RUBBER	1	
10	29020-053	ADJUSTING TUBE SWITCH MOUNT	1	
11	06922-004	NUT, HEX JAM 5/8" UNF LT HAND THREAD PLATED	1	
12	29020-036	ROD END	1	
13	08233-008	NUT, HEX 1/2"-13	4	
14	06503-010	HHCS, 1/2" X 1-1/4" UNC PLATED GRADE 5	4	
15	08233-005	NUT, HEX 5/16"-18	2	
16	29018-039	HOUSING, SWITCH	1	
17	29018-044	SWITCH, ON/OFF	1	
18	29018-029	STRAIN RELIEF	3	
19	29018-030	NUT, BULKHEAD	3	
20	08885-013	PLUG, MALE 60HZ OPERATION ONLY	1	
21	06499-004	SCREW, CAP 1/4"-20" UNC X 1/2" PLATED	2	
22	07029-004	WASHER, LOCK 1/4" PLATED	2	
23	07033-004	NUT, HEX 1/4"-20" UNC PLATED	2	
24	29018-041	CABLE, ELECTRICAL SHORT 12"	1	
25	29020-054	CABLE, ELECTRICAL LONG	1	
26	08885-014	RECEPTACLE, FEMALE 60 HZ OPERATION ONLY	1	
27	07030-008	WASHER, FLAT 1/2" PLATED	4	

ELECTRIC MOTOR ASSEMBLY

ELECTRIC MOTOR ASSY



NOTES

- △ INCLUDED WITH ELECTRIC MOTOR ITEM 2.

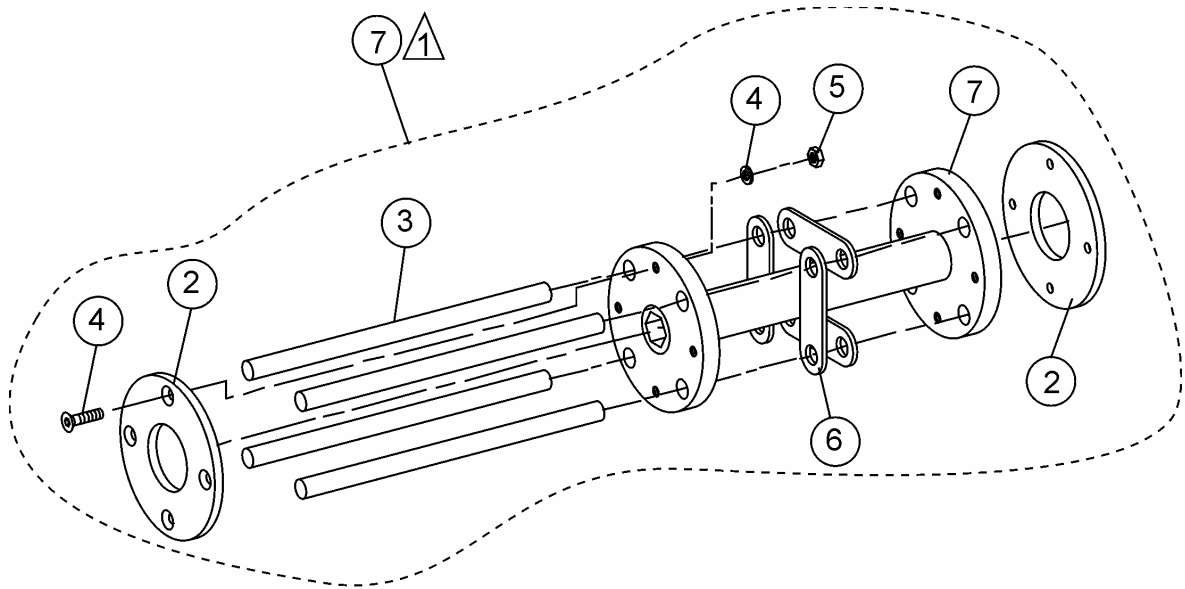
ELECTRIC MOTOR ASSEMBLY

ELECTRIC MOTOR ASSY

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-001	FRAME, MAIN	1	
2	SP8E5HP-0060	MOTOR, ELECTRIC 5HP	1	
3	SP8E5HP-0050	MOTOR PLATE	1	
4	29018-029	RELIEF, STRAIN	1	
5	29018-030	NUT, BULKHEAD	1	
6	29020-037	PULLEY, ELECTRIC MOTOR	1	
7	29020-051	BUSHING MOTOR	1	
8	06499-006	SCREW, CAP 1/4" X 3/4" UNC GRADE 5	2	
9	06500-008	KEY, 3/16" X 1/4" X 1"	1	
10	29020-006	BELT TENSIONING SCREW	2	
11	07030-006	WASHER, FLAT 3/8" PLATED	8	
12	06500-007	SCREW, CAP 3/8" X 1" UNC PLATED GRADE 5	4	
13	08233-005	LOCKNUT, 5/16"-18	2	
14	07033-006	NUT, HEXAGON 3/8"-16	8	
15	SP8-270610000	SCREW, FLAT HEAD, 3/8" X 1-1/4	4	
16	SP8-0380	CAP, PLASTIC	2	
17	29020-056	V-BELT, 3VX3554	1	
18	29020-039	BELT GUARD	1	
19	07030-006	WASHER, FLAT 3/8" PLATED	3	
20	08233-006	NUT, HEXAGON 3/8" UNC SELF-LOCKING PLATED	3	

ONE SECTION DRUM ASSEMBLY

ONE SECTION DRUM ASSY.



NOTES:

 COMPLETE FLAIL DRUM ASSEMBLY (1 SECTION)
INCLUDES ITEMS WITHIN DASHED LINES.

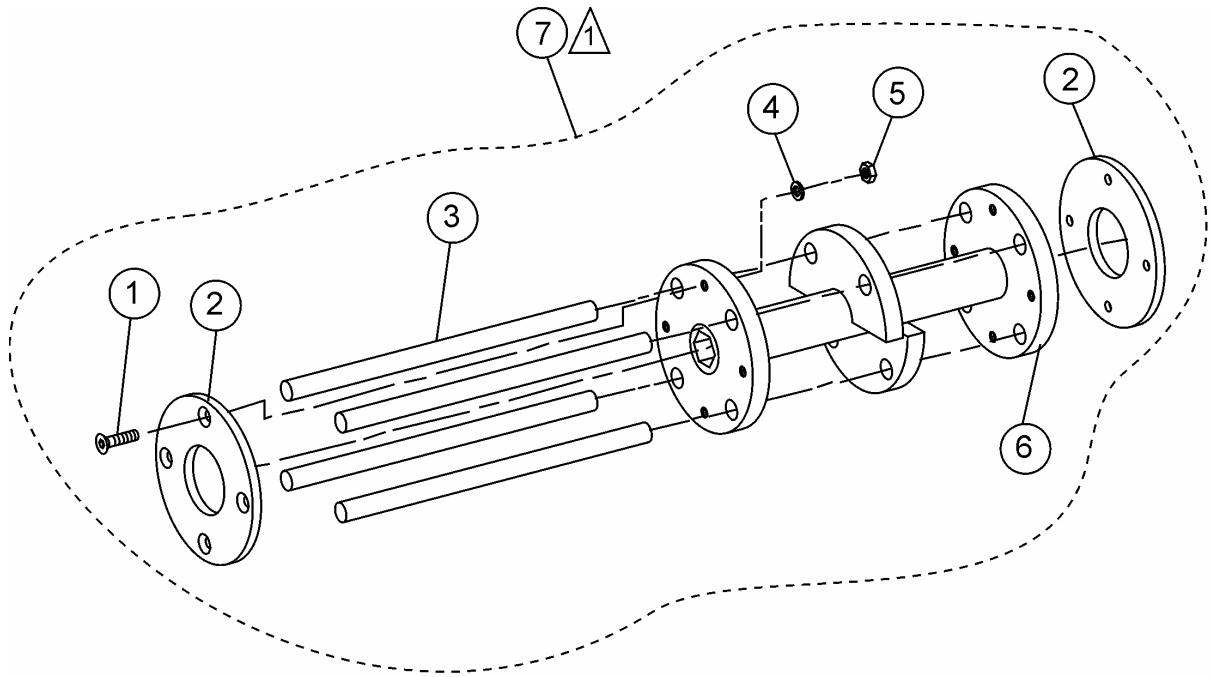
ONE SECTION DRUM ASSEMBLY

ONE SECTION DRUM ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1#	29020-040	SHCSS, ¼"-20 X 1	8	
2#	29020-041	FLAIL DRUM END CAP	2	
3#	29020-042	FLAIL DRUM ROD	4	
4#	07029-004	WASHER, LOCK 1/4	8	
5#	08233-004	LOCKNUT 1/4-20"	8	
6#	29020-044	SUPPORT STRAP	4	
7#	29020-045	FLAIL DRUM 1 SECTION	1	
8	29021-002	FLAIL DRUM, 1 SECTION COMPLETE.....	1.....	INCLUDES ITEMS W/#

TWO SECTION DRUM ASSEMBLY

TWO SECTION DRUM ASSY



NOTES:

- △ COMPLETE FLAIL DRUM ASSEMBLY (1 SECTION)
INCLUDES ITEMS WITHIN DASHED LINES.

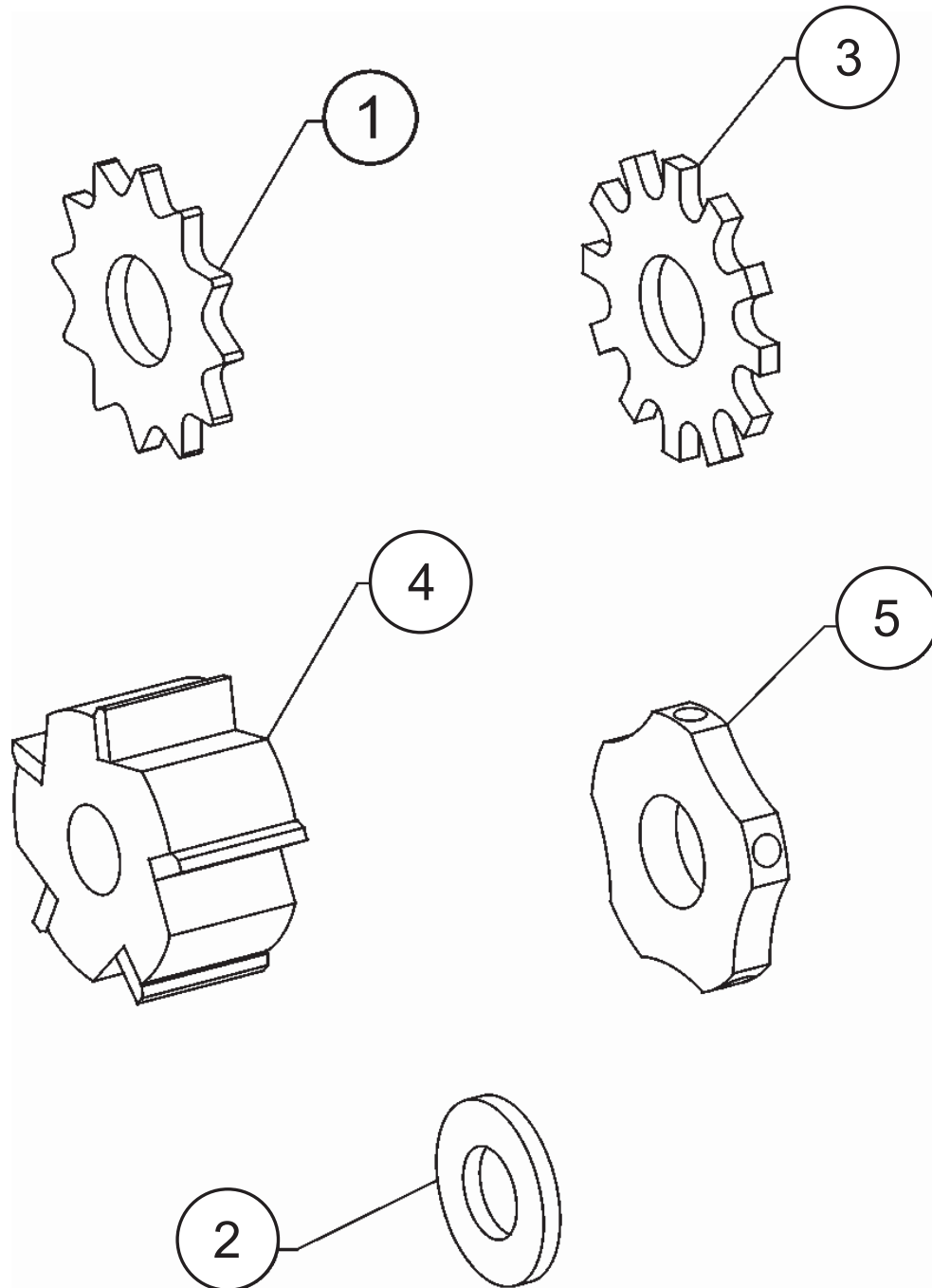
TWO SECTION DRUM ASSEMBLY

TWO SECTION DRUM ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1#	29020-040	SHCSS, ¼"-20 X 1	8	
2#	29020-041	FLAIL DRUM END CAP	2	
3#	29020-042	FLAIL DRUM ROD	4	
4#	07029-004	WASHER, LOCK 1/4	8	
5#	08233-004	LOCKNUT 1/4-20"	8	
6#	29020-043	FLAIL DRUM 2 SECTION	1	
7#	29021-003	FLAIL DRUM, 1 SECTION COMPLETE.....	1.....	INCLUDES ITEMS W/#

FLAILS, SPACERS AND WASHERS ASSEMBLY

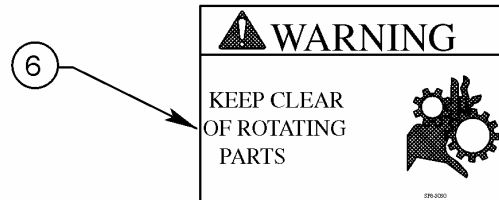
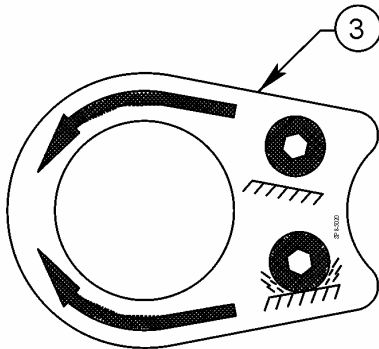
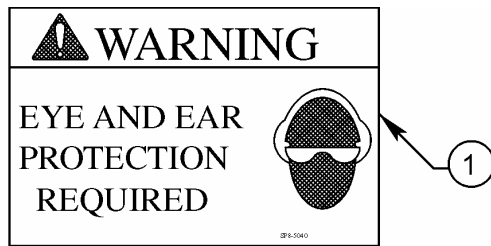
FLAILS & SPACER WASHERS ASSY.



FLAILS, SPACERS AND WASHERS ASSEMBLY

FLAILS, SPACERS AND WASHERS ASSY.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29019-010	STAR FLAIL		
2	29021-005	SPACER WASHER		
3	29019-011	BEAM FLAIL		
4	29021-004	MILLING FLAIL		
5	29019-012	PENTAGONAL FLAIL		



DECALS.

<u>NO.</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY.</u>	<u>REMARKS</u>
1	29020-045	DECAL: WARNING (EYE AND EAR)	1	
2	29020-046	DECAL: WARNING (FLAILS)	1	
3	29020-047	DECAL: DEPTH CONTROL	1	
4	512910	DECAL: MQ LOGO	1	
5	29020-048	DECAL:WARNING GUARDS	1	
6	29020-049	DECAL: WARNING KEEP CLEAR	1	

PAYMENT TERMS

Terms of payment for parts are net 30 days.

FREIGHT POLICY

All parts orders will be shipped collect or prepaid with the charges added to the invoice. All shipments are F.O.B. point of origin. Multiquip's responsibility ceases when a signed manifest has been obtained from the carrier, and any claim for shortage or damage must be settled between the consignee and the carrier.

MINIMUM ORDER

The minimum charge for orders from Multiquip is \$15.00 net. Customers will be asked for instructions regarding handling of orders not meeting this requirement.

RETURNED GOODS POLICY

Return shipments will be accepted and credit will be allowed, subject to the following provisions:

1. A Returned Material Authorization must be approved by Multiquip prior to shipment.
2. To obtain a Return Material Authorization, a list must be provided to Multiquip Parts Sales that defines item numbers, quantities, and descriptions of the items to be returned.
 - a. The parts numbers and descriptions must match the current parts price list.
 - b. The list must be typed or computer generated.
 - c. The list must state the reason(s) for the return.
 - d. The list must reference the sales order(s) or invoice(s) under which the items were originally purchased.
 - e. The list must include the name and phone number of the person requesting the RMA.
3. A copy of the Return Material Authorization must accompany the return shipment.
4. Freight is at the sender's expense. All parts must be returned freight prepaid to Multiquip's designated receiving point.

5. Parts must be in new and resalable condition, in the original Multiquip package (if any), and with Multiquip part numbers clearly marked.
6. The following items are not returnable:
 - a. Obsolete parts. (If an item is in the price book and shows as being replaced by another item, it is obsolete.)
 - b. Any parts with a limited shelf life (such as gaskets, seals, "O" rings, and other rubber parts) that were purchased more than six months prior to the return date.
 - c. Any line item with an extended dealer net price of less than \$5.00.
 - d. Special order items.
 - e. Electrical components.
 - f. Paint, chemicals, and lubricants.
 - g. Decals and paper products.
 - h. Items purchased in kits.
7. The sender will be notified of any material received that is not acceptable.
8. Such material will be held for five working days from notification, pending instructions. If a reply is not received within five days, the material will be returned to the sender at his expense.
9. Credit on returned parts will be issued at dealer net price at time of the original purchase, less a 15% restocking charge.
10. In cases where an item is accepted, for which the original purchase document can not be determined, the price will be based on the list price that was effective twelve months prior to the RMA date.
11. Credit issued will be applied to future purchases only.

PRICING AND REBATES

Prices are subject to change without prior notice. Price changes are effective on a specific date and all orders received on or after that date will be billed at the revised price. Rebates for price declines and added charges for price increases will not be made for stock on hand at the time of any price change.

Multiquip reserves the right to quote and sell direct to Government agencies, and to Original Equipment Manufacturer accounts who use our products as integral parts of their own products.

SPECIAL EXPEDITING SERVICE

A \$35.00 surcharge will be added to the invoice for special handling including bus shipments, insured parcel post or in cases where Multiquip must personally deliver the parts to the carrier.

LIMITATIONS OF SELLER'S LIABILITY

Multiquip shall not be liable hereunder for damages in excess of the purchase price of the item with respect to which damages are claimed, and in no event shall Multiquip be liable for loss of profit or good will or for any other special, consequential or incidental damages.

LIMITATION OF WARRANTIES

No warranties, express or implied, are made in connection with the sale of parts or trade accessories nor as to any engine not manufactured by Multiquip. Such warranties made in connection with the sale of new, complete units are made exclusively by a statement of warranty packaged with such units, and Multiquip neither assumes nor authorizes any person to assume for it any other obligation or liability whatever in connection with the sale of its products. Apart from such written statement of warranty, there are no warranties, express, implied or statutory, which extend beyond the description of the products on the face hereof.

Effective: February 22, 2006

OPERATION AND PARTS MANUAL

HERE'S HOW TO GET HELP

PLEASE HAVE THE MODEL AND SERIAL
NUMBER ON-HAND WHEN CALLING

UNITED STATES

Multiquip Corporate Office

18910 Wilmington Ave. Tel. (800) 421-1244
Carson, CA 90746 Fax (800) 537-3927
Contact: mq@multiquip.com

Mayco Parts

800-306-2926 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Service Department

800-421-1244 Fax: 310-537-4259
310-537-3700

MQ Parts Department

800-427-1244 Fax: 800-672-7877
310-537-3700 Fax: 310-637-3284

Warranty Department

800-421-1244, Ext. 279 Fax: 310-537-1173
310-537-3700, Ext. 279

Technical Assistance

800-478-1244 Fax: 310-631-5032

MEXICO

MQ Cipsa

Carr. Fed. Mexico-Puebla KM 126.5 Tel: (52) 222-225-9900
Momoxpan, Cholula, Puebla 72760 Mexico Fax: (52) 222-285-0420
Contact: pmastretta@cipsa.com.mx

CANADA

Multiquip

4110 Industriel Boul. Tel: (450) 625-2244
Laval, Quebec, Canada H7L 6V3 Tel: (877) 963-4411
Contact: jmartin@multiquip.com Fax: (450) 625-8664

UNITED KINGDOM

Multiquip (UK) Limited Head Office

Hanover Mill, Fitzroy Street, Tel: 0161 339 2223
Ashton-under-Lyne, Fax: 0161 339 3226
Lancashire OL7 0TL
Contact: sales@multiquip.co.uk

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This manual MUST accompany the equipment at all times. This manual is considered a permanent part of the equipment and should remain with the unit if resold.

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