

ROSCO

A LeeBoy Company

CHALLENGER II SELF-PROPELLED FRONT MOUNTED ROAD SWEEPER

SAFETY, OPERATION, MAINTENANCE and PARTS

Part Number - 38474-02

For Unit Serial Number 38025 and up

Revised 05/20/02

NOTE: It is the responsibility of the customer or user's management to train, educate or supervise his employees in the proper operation and maintenance of this equipment.

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CUSTOMER INFORMATION

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INTRODUCTION

This manual has been compiled to assist the owner and/or operator with the correct operation and routine preventive maintenance procedures for the Challenger II as manufactured by ROSCO MANUFACTURING COMPANY (ROSCO) of Madison, South Dakota, U.S.A. A parts catalog is also included in this manual to assure the accurate ordering of repair parts from Authorized Rosco Dealers/Distributors.

THIS MANUAL HAS BEEN ORGANIZED INTO SIX (6) MAJOR SECTIONS:

- | | |
|-----------------|--------------------|
| 1. INTRODUCTION | 4. MAINTENANCE |
| 2. SAFETY | 5. TROUBLESHOOTING |
| 3. OPERATION | 6. PARTS CATALOG |

A general contents page is located at the beginning of this manual as a quick reference to these sections and their major subsections. In order to receive the performance and efficiency that has been designed into the Challenger II, it is very important to:

- A. Read this manual thoroughly before operating or servicing the Road Sweeper.
- B. Keep this manual in a convenient place for ready reference.
- C. Not attempt to make repairs or adjustments you do not understand. If you require additional information or service, contact your Authorized Rosco Dealer/Distributor.

References are made in this manual to the **LEFT SIDE** and **RIGHT SIDE** of the Road Sweeper. These terms are used as the Challenger II Road Sweeper is viewed from the rear of the machine.

Serial Number - The Serial Number Plate is located inside the Cab on the left side of the rear panel of the cab. Record the Serial Number in the space below. Use the Serial Number in **all** correspondence referring to the Challenger II and when ordering parts.

Model _____

Serial Number _____

Production Year _____

Design Specifications - ROSCO MANUFACTURING COMPANY reserves the right to make design or specification changes without prior notification or to make any other improvements without incurring obligations to add them to any machine in existence.

Technical Information - ROSCO MANUFACTURING COMPANY is continuously improving its products. The technical information found in this manual was correct at the time it was approved for publication. However, if you find differences between your Road Sweeper and the information contained in this manual, please contact your local Authorized ROSCO Dealer/Distributor.

LIMITED WARRANTY POLICY & PROCEDURES

A. WARRANTY

1. If a defect in material or workmanship is found and the authorized Dealer is notified during the warranty period, ROSCO will repair or replace any part or component of the unit or part that fails to conform to the warranty during the warranty period.
2. The warranty will begin upon the completion of the warranty form by the initial customer and will expire after twelve (12) months have passed. The Warranty Card must be filled out within ten (10) days of delivery of the unit.
3. Engines and truck chassis are warranted by their manufacturers and may have warranty coverage that differs from that of ROSCO.
4. Replacement parts furnished by ROSCO are covered for the remainder of the warranty period applicable to the unit or component in which such parts are installed.
5. ROSCO has the right to repair any component or part before replacing it with a new part.
6. All new replacement parts purchased by a ROSCO dealer will carry a six (6) month warranty. Remanufactured parts purchased by a ROSCO dealer will carry a ninety (90) day warranty.

B. LIMITATIONS

ROSCO has no obligation under this warranty for:

1. Any defects caused by misuse, misapplication, negligence, accident or failure to maintain or use in accordance with the most current operating instructions.
2. Unauthorized alterations.
3. Defects or failures caused by any replacement parts or attachments not manufactured by or approved by ROSCO.
4. Failure to conduct normal maintenance and operating service, including without limitation, providing lubricants, coolant, fuel, tune-ups, inspections or adjustments.
5. Unreasonable delay, as established by ROSCO, in making the applicable units or parts available upon notification of a service notice ordered by ROSCO.
6. The warranty responsibility on all engines and/or truck chassis rests with the respective manufacturer.
7. ROSCO may have support agreements with some engine and/or truck chassis manufacturers for warranty and parts support.

LIMITED WARRANTY POLICY & PROCEDURES

C. ITEMS NOT COVERED

ROSCO is not responsible for the following:

1. Charges for travel time, mileage or overtime.
2. Charges related to transporting the product to and from the place at which warranty work is performed.
3. Freight charges related to transporting repair parts to the place at which warranty work is performed.
4. All used units or used parts of any kind.
5. Repairs made necessary by normal wear and tear or brought about by abuse or lack of maintenance of the equipment, except for premature failures.
6. Attachments not manufactured or installed by ROSCO.
7. Liability for incidental or consequential damages of any type, including, but not limited to lost profits or expenses of acquiring replacement equipment.
8. Miscellaneous charges.

D. OTHER WARRANTIES

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED, STATUTORY AND IMPLIED WARRANTIES APPLICABLE TO UNITS, ENGINES OR PARTS, WITHOUT LIMITATION, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, OR ALLEGED NEGLIGENCE OR LIABILITY WITHOUT FAULT, SHALL ROSCO BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT OR REVENUE, COST OF CAPITAL, COST OF SUBSTITUTED EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME COSTS, LABOR COSTS OR CLAIMS OF CUSTOMERS, PURCHASERS OR LESSEES FOR SUCH DAMAGES.

SPECIFICATIONS

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DIMENSIONS

LENGTH, overall	194 inchs (4.93 m)
WIDTH.....	95 inches (241.3 cm)
HEIGHT, ROPS Cab	111 inches(282 cm)
WEIGHT, standard equipped.....	7,500 lbs. (3402 kg)
WHEELBASE	65 inches (165 cm)
TURNING RADIUS, outside.....	10.5 feet (3.2 m)
TURNING RADIUS, inside.....	3 feet (.914 m)
GROUND CLEARANCE, brush	28 inches (71.21 cm)
GROUND CLEARANCE, unit	12 inches (30.48 cm)
TREAD WIDTH, front & rear	61.25 inches (1.56 m)
TIRES.....	Four 8.75X16.5 bias, 8-ply, load range D, tubeless, highway tread

DRIVE TRAIN

ENGINE

Type	4-cylinder, water cooled, diesel
Make and Model	John Deere series 300 model 4045D
Displacement.....	276 cu. in (4.5 liters)
Bore	4.19 inches (106 mm)
Stroke	5 inches (127 mm)
Power @ 2500 RPM	80 hp (59.7 kw)
Ignition System	12 volt
Battery	12 volt, 850 cca
Alternator	63 amp rated
Air Cleaner	Donaldson dry type , dual element
Oil Filter	Full flow
Oil Capacity	9.0 qts (8.5 liters)
Idle Speed	850 rpm
Fuel Tank Capacity	38 U.S. gallons (143.85 liters)
Cooling System Capacity	16 qt (18 liters)

SPECIFICATIONS

DRIVE TRAIN (continued)

STEERING

Type Full hydraulic orbital motor with automotive steering wheel

FRONT AXLE

Type Heavy duty Dana-type, full float with limited slip differential

Brakes Hydraulic brakes with parking brake

REAR AXLE

Type Heavy duty truck type, oscillating

HYDROSTATIC DRIVE SYSTEM

Pump, Make and Model Sauer 90 series

Pump, Displacement 75 cm³

Motor, Make and Model Sauer 90 series 100 cc

Hydraulic Reservoir 25 U.S. gallon (94.6 liters)

Fluid Type See Hydraulic Fluids Chart in Section IV, **Maintenance**

Filter 5-micron

Oil Cooler

BRUSH OPERATING SYSTEM

PUMP Prince

MOTOR Parker/Ross

BRUSH Patented "Quick Change" 35" (88.9 cm) dia X 7' (2.14 m) long,
Polypropylene filling

BRUSH HOOD Full length with 140°, steel cover with rubber apron

BRUSH SPEED Variable

BRUSH ANGLE 30°, left or right

DOWN PRESSURE CONTROL Hydraulic, fully adjustable

SPECIFICATIONS

MISCELLANEOUS EQUIPMENT

INSTRUMENTATION Ammeter, fuel gauge, hourmeter, water temperature
 tachometer, hydraulic oil pressure, engine oil pressure, & key type ignition switch

SEAT Padded, weather proof, with back rest & seat belt

BACK-UP ALARM 97db +/- 4db at 4 ft (122 cm)

ROPS CAB.... Rollover protection structure with extended front windshield, fresh air
 pressurized, front windshield wiper and washer, tinted safety glass, full
 length side sliding windows, rear sliding window, and dome light. Two
 headlights, stop, tail and turn signals with controller and 4-way flasher

OPTIONAL EQUIPMENT

AIR CONDITIONING & HEATER Cooling/Heating - 21,000/40,000 BTU

DEFROSTER FAN 12 volt, front or rear

MIRRORS Inside - rear view; outside - West Coast type

LIGHTS Front or rear work lights

ROTATING BEACON or STROBE 12 volt

WATER SPRAY SYSTEM 150 gal (475 liters), 7 ft. (2.14 m) spray bar with
 electric pump

WIDER BRUSH 8 ft. (2.44 m) brush with poly/steel core

SAFETY SECTION

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SAFETY

SAFETY ALERT SYMBOLS

This Safety Alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the ROSCO Road Sweeper and in its manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons:

- *Accidents Disable and Kill**
- *Accidents Cost**
- *Accidents Can be Avoided**

Signal Words

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety message. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

An immediate and specific hazard which **WILL** result in severe injury or death if the proper precautions are not taken.

WARNING

A specific hazard or unsafe practice which **COULD** result in severe injury or death if proper precautions are not taken.

CAUTION

Unsafe practices which **COULD** result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

Equipment Damage Symbol



Throughout this manual, whenever you see this "Broken Bolt" symbol, it means:

CAUTION

Equipment on the machine could be damaged through improper performance of an operation, maintenance or repair procedure.

SAFETY

YOU are responsible for the safe operation and maintenance of your ROSCO Road Sweeper. You must ensure that you and anyone else who is going to operate, maintain or work around the machine be familiar with the operating and maintenance procedures. Special attention should be given to learning and understanding the safety information contained in this manual.

In accordance with OSHA regulations 1928.51 and 1928.52, operating instructions must be provided initially to operators or employees **before** allowing them to operate the Road Sweeper, and at least annually thereafter.

The most important safety device on this equipment is a well trained and safe operator. It is his/her responsibility to read and understand all safety and operating instructions in this manual. A person who has not read and understood all operating and safety instructions is not qualified to operate the Road Sweeper. An untrained operator exposes himself/herself and bystanders to possible serious injury or death. All accidents can be avoided!

Do not modify the Road Sweeper in any way. Unauthorized modification may impair function and/or safety and affect the working life of the equipment.

ROSCO Manufacturing Company assumes **NO LIABILITY** for accident or injury incurred through the improper use of this equipment.

SAFETY PRECAUTIONS

GENERAL



1. Read and fully understand the operator's manual and the safety decals on the machine **before** trying to operate or service this equipment.

2. Have a first aid kit available and **know how to use it.**



3. Keep a "charged" fire extinguisher within reach whenever you work in an area where fire may occur. Have the correct type of extinguisher for your situation and **know how to use it:**

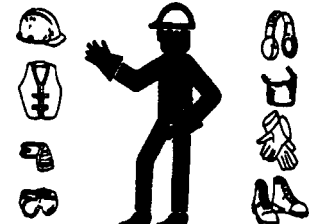


Type A: Wood, paper, textile and rubbish.

Type B: Flammable liquid

Type C: Electrical equipment

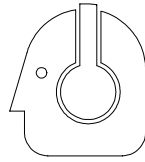
4. Wear safe work clothing. **Do not** wear clothing that is loose fitting or in poor repair when working on machinery. **Do not** wear rings or wrist watches when working on machinery. They can catch on moving parts and pull you into the machinery, causing serious injury. Wear sturdy, rough-soled work shoes, safety glasses and any other protective gear that is warranted by the work environment.



5. Keep work area organized and clean. Wipe up oil spills of any kind. Keep tools and parts off floor. Eliminate the possibility of a fall which could result in serious injury.

SAFETY

6. Wear appropriate ear protection when exposed to excessive noise for prolonged periods of time. Permanent loss of hearing can result from prolonged exposure.



7. **Do not** hurry! Use recommended hand holds and steps with at least three points of support when getting on and off the Road Sweeper. Keep steps, floor, hand holds and controls clean and free from grease. Face the machine when climbing up and down and **never** jump off

or dismount while the machine is in motion. Falls from the machine can cause serious injury.

5. When transporting the Road Sweeper, **know and use** all required signal devices. Use tail lights, slow moving vehicle signs and warning beacons when on public roads. Provide an escort when necessary.

6. **Do not** allow riders on the Road Sweeper when transporting. Death or serious injury can occur if riders fall off or under the machine while it is in motion.

7. Clean reflectors and lights before transporting to help avoid collisions with other traffic.

8. **Do not** tow the Road Sweeper, except to remove it from the road or load it on a trailer.

PRE-OPERATING

1. **Always** follow the pre-operation instructions in the **Operations** section of this manual before operating the Road Sweeper. Be sure **all** controls and gauges are operating properly before starting a job. **Do not** operate the Road Sweeper if any of the warning buzzers/lights are "on". If any malfunctions are found prior to or during operation, shut down the Road Sweeper and **report the problem to a supervisor**.

2. Keep all hydraulic lines, fittings and couplers tight and free of leaks. **Leaking fittings are a fire hazard**. Hydraulic fluid under pressure can pierce skin, causing serious injury or toxic reaction. **Do not feel for hydraulic leaks with your hands**.

3. The operator is responsible for the work area. Clear the area of people **before** starting or operating the unit. Death or serious injury can occur to bystanders from being crushed under a moving machine or being hit by debris.

4. **Know and understand** the job site traffic flow patterns and obey flagmen, road signs and signals.

STARTING AND STOPPING

1. Walk around the Road Sweeper and **be sure** to warn all personnel in the area before starting the Road Sweeper. **Be sure the area is clear before starting**. Death or serious injury can occur to bystanders from being crushed under a moving machine or being hit by material.

2. **Always** adjust, secure and latch the seat and fasten the seat belt **before** starting the Road Sweeper. Start or operate the machine **only** from the operator's seat.

3. **Be sure** the parking brake is applied and the Forward/Reverse control is in the neutral position **before** starting the Road Sweeper.

4. **Do not** bypass the neutral-start system. The neutral-start system must be repaired if it malfunctions.

5. **Do not** operate the engine in an enclosed area without adequate ventilation. Exhaust gases contain carbon monoxide, an odorless and deadly poison.



SAFETY

6. **Always** park the Road Sweeper on level ground whenever possible. Apply the parking brake. On grades, park the Road Sweeper with the wheels securely blocked.

7. **Before** dismounting from the unit, place the Forward/Reverse pedal in neutral, turn off all accessories, set the parking brake, shut off the engine and remove the ignition key.

BRAKING

1. The operator must become accustomed to using the hydrostatic transmission to assist in braking. This is best done by moving the Travel Pedal into the neutral position **before** applying the service brake with the foot pedal.

2. The service brakes alone are **not** sufficient to stop the Road Sweeper if it is in forward or reverse drive mode.

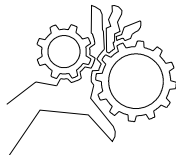
3. Stopping distances must be anticipated for **all** conditions. If stopping on a grade, the distance needed to come to a stop will be longer. Familiarize yourself with these variables so you can anticipate when a longer stopping distance is required.

OPERATING

1. **Be sure** to wear the seat belt when operating the Road Sweeper to maximize the protection capability of the ROPS cab.

2. **Know and use** the hand signals required for each job and know who has the responsibility for signaling.

3. Keep hands, feet, hair and clothing away from moving parts. Death or serious injury can occur from entanglement in moving parts.



4. Watch for bystanders and **never** allow anyone to reach into the Road Sweeper while it is operating.

5. If any of the controls such as steering, service brakes or engine, fail during operation, **stop the Road Sweeper immediately**. Apply the parking brake, turn off engine and block the wheels until the unit can be repaired or safely towed away.

6. Place **all** controls in neutral, stop engine, set park brake, remove ignition key and wait for **all** moving parts to stop **before** servicing, adjusting, repairing or unplugging. Death or serious injury can occur from entanglement in moving parts.

7. **Do not** go under the vehicle when the engine is running. Death or serious injury can occur if one becomes crushed by or entangled in moving parts.

8. After servicing, be sure that **all** tools and parts or servicing equipment are removed from the vehicle or engine.

9. **Be sure** to reinstall safety devices, guards or shields after adjusting and/or servicing the machine. Death or serious injury can occur from entanglement in moving parts.

10. When traveling down hill, **slow down** and keep the engine RPM at maximum.

11. Drive the Road Sweeper at speeds compatible with road and weather conditions. Special care should be taken on slopes, rough ground or when turning. Avoid hazards such as ditches, underground lines, trees, cliffs and overhead wires.

MAINTENANCE

1. **Do not attempt repairs unless trained**. Refer to manuals and experienced repair personnel for help.

2. Follow **all** operating, maintenance and safety information in the manual.

SAFETY

3. Support the machine with blocks or safety stands when changing tires or working beneath it. Death or serious injury can result from the machine falling off a jack and crushing you.

4. Place **all** controls in neutral, stop engine, remove ignition key and wait for **all** moving parts to stop **before** servicing, adjusting or repairing. Death or serious injury can occur from entanglement in moving parts.

5. Follow good shop practices: **Keep** service area clean and dry. **Be sure** electrical outlets and tools are properly grounded. **Use** adequate light for the job at hand.



6. Make sure **all** guards are in place and properly secured after maintenance work is completed. Serious injury can occur from being caught in unguarded moving parts.

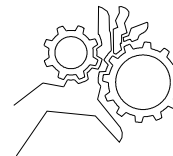
7. **Never** wear baggy or frayed clothing when working around or on any of the drive system components. Loose garments can become entangled in moving parts, pulling the person into the machine, causing serious injury or death.

8. **Before** applying pressure to a hydraulic system, **be sure** all lines, fittings and couplers are tight and in good condition. Leaking fittings are a fire hazard. Hydraulic fluid under pressure can pierce the skin which can result in serious injury or toxic reaction.



9. Wear protective glasses and other required safety equipment when servicing or repairing the Road Sweeper.

10. Keep hands, feet, hair and clothing away from moving parts. Death or serious injury can occur from entanglement in moving parts.



11. Clear the area of bystanders when carrying out any maintenance, repairs or adjustments.

12. **Do not** service the Road Sweeper while it is in motion or while the engine is running. If the engine must be running to service a component, place Forward/Reverse control in neutral, apply parking brake, block wheels and use **extreme caution**.

13. Do not make repairs on pressurized components, fluid, gas or machinery until the pressure has been properly released. Use **extreme caution** when removing radiator caps, drain plug, grease fitting or pressure taps. Park the Road Sweeper and let it cool before opening a pressurized compartment.

14. When inflating tires, use a self attaching inflation chuck with a remote shut-off and **stand clear** of the tire. A tire can explode with great force.

15. **Do not** operate the unit with loose wheels or rims. Check wheel nuts periodically for tightness. Refer to the Bolt Torque chart at the end of the **Maintenance** section of this manual.

16. Keep brakes and steering systems in good operating condition.

HYDRAULICS

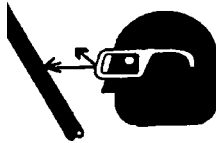
1. Make sure that **all** components in the hydraulic system are kept in good condition and are clean.

2. **Replace** any worn, cut, abraded, flattened or crimped hoses and metal lines.

SAFETY

3. **Do not** make repairs using tape, clamps or cements. The hydraulic system operates under **extremely** high pressures. Such repairs will fail suddenly and create a hazardous condition.

4. Wear proper hand and eye protection when searching for a high pressure leak. Use a piece of wood or cardboard as a back stop to isolate and identify leaks. **Do not use your hands.** Relieve pressure on the system before doing any repairs or disconnecting lines, hoses or valves. Before reapplying pressure to a hydraulic system, make sure all lines, fittings and couplers are tight and in good repair.



5. Pressurized hydraulic fluid or oil has sufficient force to penetrate the skin. Serious infection or toxic reaction can develop from



hydraulic fluid piercing the skin. If injured by a high pressure stream of hydraulic fluid, seek medical attention **immediately.**

TRANSPORT

1. Be sure you are in compliance with all local regulations regarding transporting of equipment on public roads and highways. **DO NOT DRINK AND DRIVE.**

2. **Be sure** the lights and reflectors that are required by local highway and transport authorities are in place, are clean, are in good repair and can be seen clearly by **all** overtaking and oncoming traffic.

3. Raise and secure broom **before** transporting.

STORAGE

1. Store the Road Sweeper in an area away from human activity.

2. **Do not** permit children to play on or around the stored machine.

3. Make sure the unit is stored in an area that is firm, level and free of debris.

4. Store the Road Sweeper inside a building or cover with a weather-proof tarpaulin and support securely.

TIRES

1. Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

2. **Do not** attempt to mount a tire unless you have the proper equipment and experience to do the job.

3. Have a qualified tire dealer or repair technician perform required tire maintenance.

4. Support the machine with blocks or safety stands when changing tires or working beneath the machine.

5. **Do not** inflate tires beyond the maximum recommended inflation pressure.

6. **Do not** hammer on rims with steel hammers. Use rubber, lead, plastic or brass faced mallets if necessary.

7. Put hardwood blocks under the jacks regardless of how hard the ground is. **Always** support the vehicle with blocks or preferably jack stands in case the jack slips.

SAFETY

REFUELING

1. Handle fuel with care. It is highly flammable. **Do not** overfill fuel tank. Expansion and spillage create a fire hazard.

2. Clean up spilled fuel **before** restarting engine. A spark could ignite the spillage.

3. **Do not** smoke while refueling the machine. **Do not** refuel the machine near open flame or sparks. **Do not** refuel while the engine is running. **Do not** use fuel for cleaning purposes. Death or serious injury can occur from explosion or fire.



4. Fill fuel tank outdoors to reduce the chance of fumes accumulating and causing a fire or explosion. Keep the hose nozzle or funnel inside the tank while filling to avoid spilling fuel.

5. Prevent fires by keeping machine clean of accumulated grease and debris.



6. **Do not** fill tank to capacity. Allow room for expansion to reduce the risk of fuel expanding and spilling from the tank.

7. Tighten the fuel tank cap securely. If cap is lost, replace it only with the original manufacturer's approved cap. A non-approved cap without proper venting may result in pressurization of the tank.

8. Use the correct fuel grade for the operating season. Refer to the Hydraulic Fluid chart in the **Maintenance** section of this manual.

BATTERY



1. Keep all sparks and flames away from the battery. Fumes from the battery's electrolyte solution are **extremely explosive**. Acid propelled by an explosion can cause blindness if it comes in contact with eyes.

2. Wear safety glasses when working near batteries. If you come in contact with battery electrolyte solution, wash it off **immediately**.

3. **Do not** tip batteries more than 45 degrees to avoid spilling electrolyte solution and causing a chemical burn.

4. To avoid injury from a spark or short circuit, **disconnect battery ground cable** before servicing any part of the electrical system. Failure to do so can result in electrical shock or burn.

5. Use jumper cables **only** in recommended manner. Improper use can result in battery explosion or unexpected Road Sweeper motion. Refer to the engine and battery pages of the **Maintenance** section of this manual.

SAFETY DECALS

1. Keep safety decals and signs clean and legible at all times.

2. Become familiar with the content and the position of each safety decal. Refer to the **Safety Decal** section in this manual for position and part number.

3. Replace safety decals and signs that are missing or have become illegible.

4. When replacing parts, be sure to check that any safety decals that were on the original part are also on the new part.

5. Obtain safety decals or signs from your Authorized ROSCO Dealer/Distributor.

DECAL INSTALLATION

1. Be sure that the installation area is clean and dry. Use hot soapy water and dry the area thoroughly before installing decals.

2. Decide on the exact position by taking measurements and test fitting before you remove the backing paper.

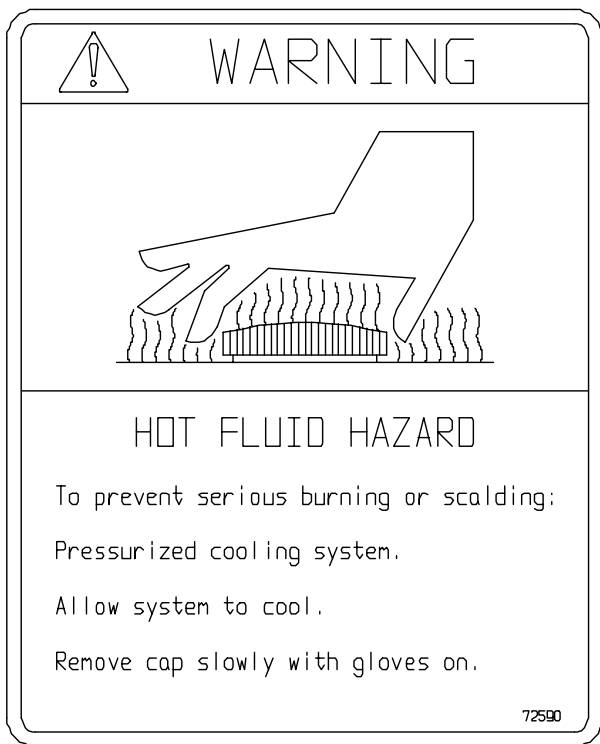
SAFETY

3. For decals with no top protection paper, decide on the decal location and remove the smallest portion of the split backing paper.
4. Align the decal over the specified area and carefully press the small portion with the exposed adhesive backing in place.
5. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
6. Small air pockets can be pierced with a pin and smoothed out using a piece of decal backing paper.
7. If the decal has a protective top paper, use hot soapy water on the surface to which the decal is being applied. Leave wet. After deciding the location, remove the backing paper and soak the decal in clean soapy water before application. This will help prevent air bubbles in the finished decal.
8. Smooth the decal into place with a sponge and check for air bubbles. Small air pockets may be pierced with a pin and smoothed out. When the decal is completely smoothed out, carefully remove the top paper.

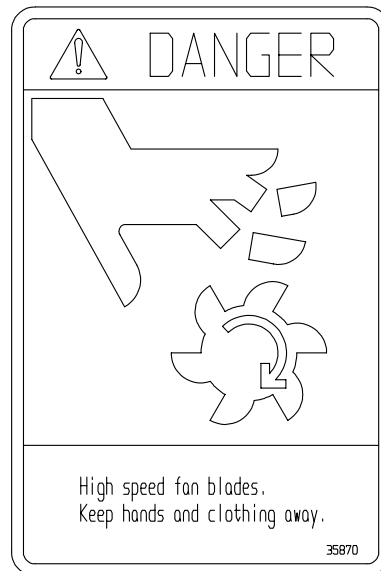
SAFETY DECAL LOCATIONS

The types of safety decals and their location on the Road Sweeper are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various safety decals, the type of warning and the area, or the particular function related to that area, which requires your Safety Awareness.

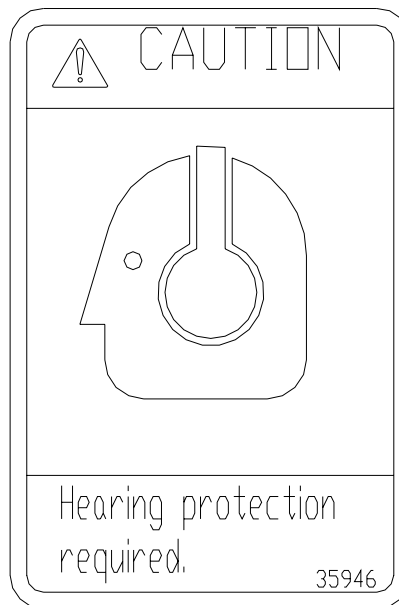
Think SAFETY! Work SAFELY!



Located on engine cover near radiator fill - Part # 72590



Located on under engine cover - Part # 35870



Located inside of cab on right frame - Part # 35946

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

SAFETY DECAL LOCATIONS



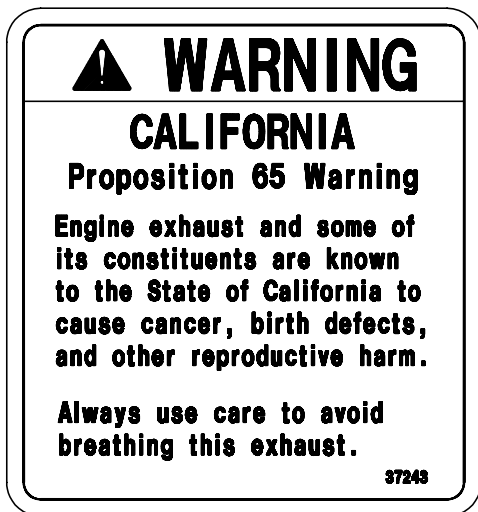
Located outside the cab door - Part # 36202



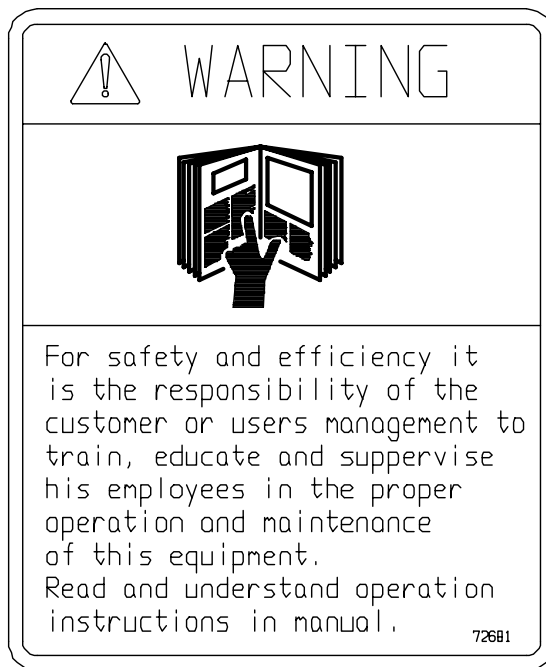
Located on ends of brush cover - Part # 36857

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

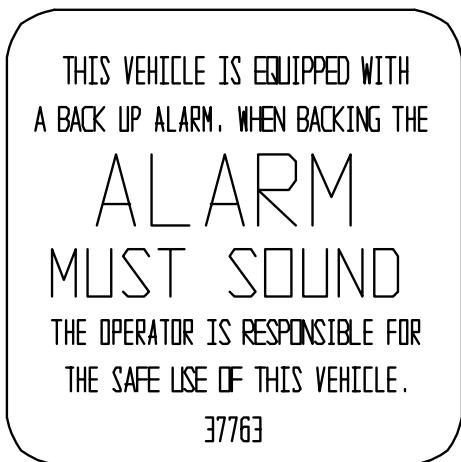
SAFETY DECAL LOCATIONS



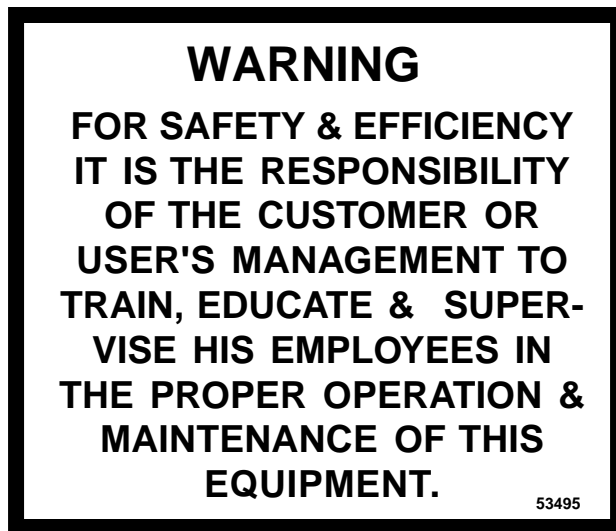
Located inside of cab on right frame -
Part # 37243



Located inside of cab on right frame -
Part # 72681



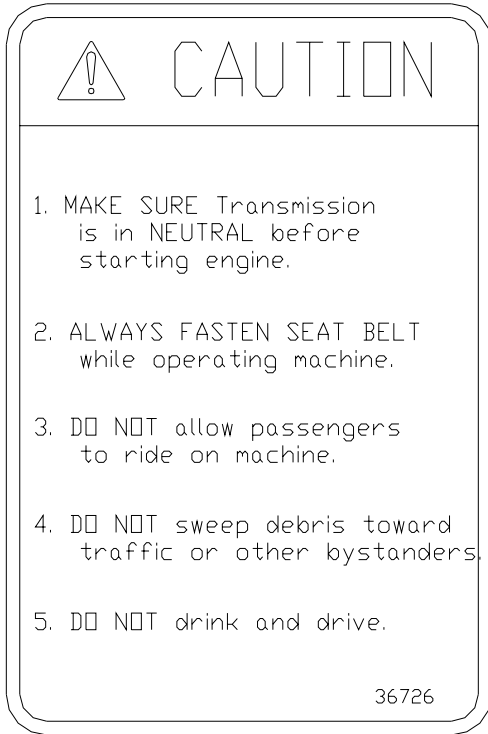
Located inside of cab on right frame -
Part # 37763



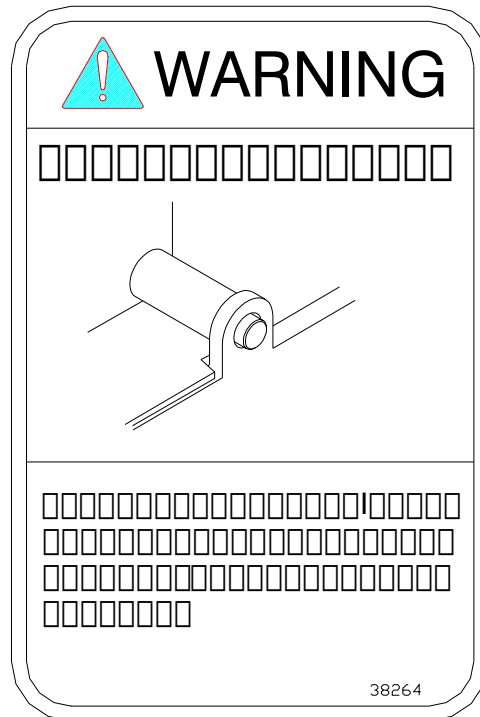
Located inside of cab on right frame -
Part # 53495

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

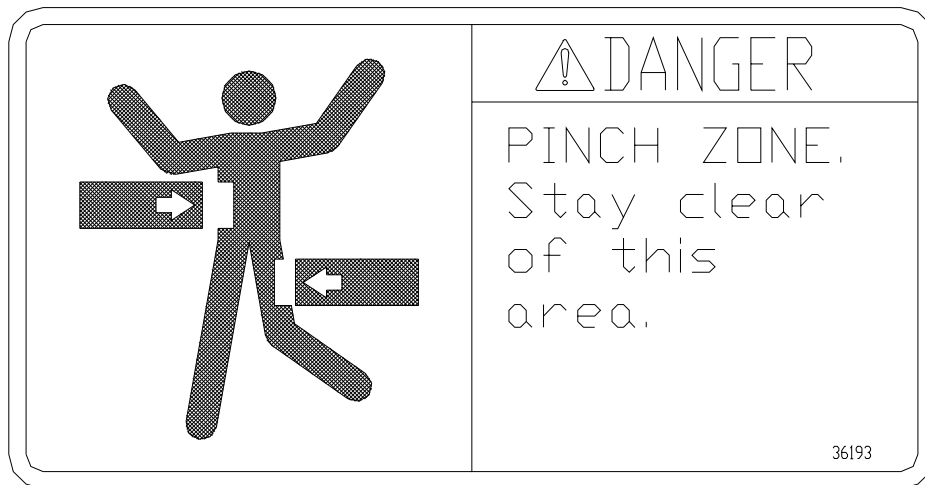
SAFETY DECAL LOCATIONS



Located inside of cab on right frame - Part # 36726



Located inside of cab on lower corners of the wall back - Part # 37243



Located on back side of broom carriage on each end - Part # 36193

REMEMBER - If Safety Decals are illegible or missing because of wear or replacement of parts, new decals must be applied. New decals are available from your Authorized ROSCO Dealer.

OPERATION SECTION

General Description 3.2

Cab Control Components 3.3 - 3.4

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Shut Down 3.10

OPERATION

It is very important that owners and operators understand the operating characteristics of the Challenger II. An understanding of the operating procedures will ensure safe operation and high productivity. Please study this manual BEFORE operating or servicing the Sweeper.

The Challenger II is a fully hydrostatic, self-propelled Road Sweeper. The Hydrostatic Drive System and Hydraulic System, which powers the steering and brush drive, have one common oil reservoir.

GENERAL DESCRIPTION

Hydrostatic Drive System - This system propels the Challenger II forward and reverse with dynamic braking. The system consists of a variable displacement pump driven off the rear of the engine. This pump provides hydraulic power to a fixed displacement hydraulic motor. The motor powers the front driving axle through a drive shaft.

Hydrostatic Drive Controls - The drive control for travel is a rocker pedal to be used by the operator's right foot. The machine is propelled forward by rocking the pedal forward and reverse by rocking the pedal to the rear. The pedal also controls the neutral start switch, which allows the engine to be cranked only when the pedal is in neutral (centered).



***Never** decelerate or change direction rapidly. Changing direction rapidly may cause excessive heat and pressure in the hydrostatic drive system. This can shorten the system component life.*

Steering & Brush Hydraulic System - A single gear pump powered off the rear travel pump directs hydraulic fluid to a flow divider. The divider splits the flow to steering and the brush rotation control. The steering flow is split again to supply flow to the steering system and to the valves which control the brush raise, swing and brush quick change. The steering flow **always** receives the priority flow so it is always powered.

Steering - Steering is performed by a hydraulically powered orbital system and operated by a steering wheel. In the event of a hydraulic power failure, the machine can still be steered.

Brush Control - The brush speed is controlled by a valve to give forward and reverse rotation. The brush rotational speed is controlled by the engine RPM. When sweeping with reverse rotation, **do not** operate the engine above 1500 RPM. Doing so can cause rock particles to travel at high velocity. These can damage the machine and injure bystanders. The brush will swing right or left to eject material either way. The brush lift and float are controlled by a control valve and a float regulator. When the valve is in the down position, the brush will float. The float regulator controls the amount of float.

OPERATION

CAB CONTROL COMPONENTS

1. Travel Pedal - This controls the direction of travel. It is the large pedal located on the right side of the cab floor.
2. Service Brake Pedal - This is used to stop the machine. It is located on the far right side of the cab floor.
3. Engine Throttle - This knob is used to control the speed of the engine. It is located on the left side of the operator's seat. Turn the knob to adjust the engine speed.
4. Park Brake Lever - This sets the parking brake. It is located on the far right side wall. Pull down to release and push up to set the brake.
5. Steering Wheel - Located in the center of the dash panel.
6. Brush Rotation Lever - This controls the direction of the brush rotation. It is located on the left side of the dash panel. Pushing the lever down turns the brush forward. Pushing the lever up turns the brush in reverse. The center position is neutral.
7. Brush Swing Lever - This controls the swing direction of the brush. The lever is located on the right side of the dash panel and is the inner lever of the pair located there. Pushing the lever down turns the brush to the right. Pushing the lever up turns the brush to the left.
8. Brush Lift Lever - This controls the up and down motion of the brush. It is located on the right side of the dash panel and is the outside lever. See page 3.8 for more information.
9. Operator's Seat - The operator's seat is adjustable with a slide adjustment located under the seat.
10. Brush Down Pressure Control Knob - This controls the amount of hydraulic pressure needed to keep the brush suspended when operating in the Float position. It is located on left side of the front dash panel near the floor. See page 3.9 for more information.
11. Fuel Level Gauge - This is located in the central area of the dash panel.
12. Oil Pressure Gauge - This is located in the central area of the dash panel.
13. Water Temperature Gauge - This is located in the central area of the dash panel.
14. Ammeter - This is located in the central area of the dash panel.
15. Hour Meter - This will start to count as soon as the engine starts.
16. Tachometer - This is located in the central area of the dash panel.
17. Ignition Switch - This is a key-operated ignition and is also neutral-start protected. It is located on the lower right side of the dash.
18. Horn - This button, on the left side of dash panel, sounds the horn when pressed.
19. Beacon - This switch is located in the center of the dash panel. Raise the switch up to turn the beacon on and lower the switch to turn the beacon off.
20. Headlights - The pull out switch on the right side center dash panel operates the headlights. Pulling the switch to the first stop is low-beam and pulling the switch out all the way is hi-beam. There is an indicator for the hi-beam.
21. Hydraulic Pressure - This gauge shows the hydraulic pressure lifting or holding the brush. It is located on the right side of the dash panel above the brush lift lever.
22. Water Spray (Optional) - If unit is equipped with water spray there will be a toggle switch on the center dash panel. Push the switch up to activate water spray.

OPERATION

CAB CONTROL COMPONENTS (cont)

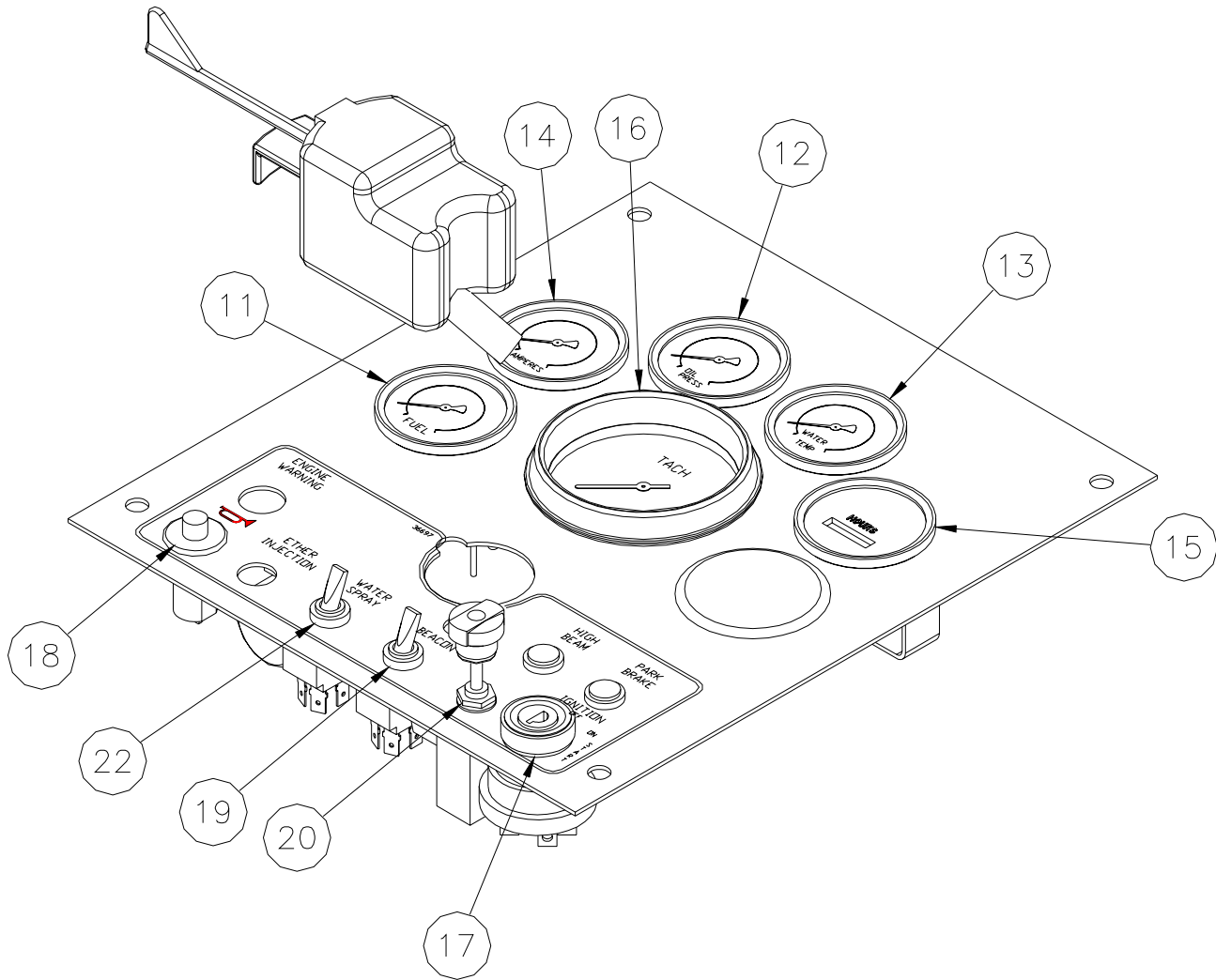


Figure 3-A
Top View - Dashboard Layout

OPERATION

PRE - OPERATION CHECKLIST

Every operator must read and understand the operating procedures and safety precautions that follow. A pre-operation checklist is provided. Follow this checklist to ensure efficient and safe operation of the Challenger II

Check the following areas before operating the Road Sweeper and each time thereafter:

1. Recommended fluid types and quantities required are listed in the **Specifications** section of this manual.

Check all fluid levels as detailed in the **Maintenance** section of this manual, including the following:

- A. Check ENGINE OIL. Add if low. Be careful not to overfill.
- B. Check HYDRAULIC OIL RESERVOIR. Add if low.
- C. Check ENGINE DIESEL FUEL TANK. Fill if low.
- D. Check ENGINE COOLANT LEVEL at radiator. Fill if low.
- E. Check BRAKE FLUID at brake master cylinder. Fill to FULL line.

2. Drain the engine **Fuel/Water Separator** filter.

3. Check the engine **Air Filter Indicator**. Clean or replace filters if indicator shows red or 20 inches of restriction.

4. Check engine belts and hoses for wear or fraying. Replace any that show signs of wear, cuts or abrasion.

5. Check parking brake adjustment.

6. Check tire pressure. Maintain even pressure in all four tires at 65 psi.

7. Check the Challenger II for possible loose bolts or signs of leaking hoses. Refer to the **Maintenance** section for hydraulic leak inspection procedures.



Know the location and function of the controls before starting the engine. Refer to Figure 3-A on page 3-4 of this section for the position of all operating controls and system monitoring gauges.

OPERATION

START-UP

In the following procedures, the item numbers listed in () refer to pages 3-3 to 3-4 (unless otherwise noted) in this section.



- WARNING:** **Read** manual before starting.
Train all operators before they work with this machine.
Do not smoke around the unit.
Wear protective gear and clothing.

START UP AND ENGINE OPERATION

1. The Travel Pedal (item 1) must be in the **neutral position**. The pedal is spring loaded to default to the neutral position when there is no pressure on it. A Neutral Start Switch has been installed to prevent operation of the engine when the transmission is not in neutral.



Allow the starter to cool for **2 minutes** between unsuccessful attempts to start the engine. Failure to follow these guidelines can damage the starter motor.

2. Apply the Parking Brake (item 4).
3. Set the Engine Throttle (item 3) to one-half speed.
4. Turn the Ignition Switch key (item 17), which activates the engine starter. As soon as the engine starts, release the switch.

5. Move the Engine Throttle position to **idle** as soon as the engine starts.

Be sure oil pressure is observed within **15 seconds** after starting the engine. If no oil pressure is shown on the gauge in 15 seconds, shut down the engine and determine the cause.



Do not crank engine for more than **30 seconds** at a time. Continuous cranking can cause starter failure.

NOTE: IF THE STARTER DOES NOT TURN THE ENGINE OVER, shut off the ignition immediately and make no further attempts to start the engine until the condition is corrected. Refer to Trouble Shooting Section 5 of this manual (or the John Deere Diesel Engine manual) for possible solutions. For further trouble analysis, contact your John Deere Diesel Engine Service Dealer.

6. Check the gauges on the dash panel for proper readings and make the necessary corrections.

7. While the engine is warming up, adjust the position of the seat and mirrors for the operator's convenience.

8. When the engine is running properly, fasten the seat belt and familiarize yourself with the operation of the controls.



Caution: Always wear seat belts when operating the Sweeper. Sudden speed changes or a roll over can cause an unrestrained operator to be thrown from the machine.

OPERATION

Do not idle the engine for more than **10 minutes**.



Long periods of idling can damage the engine. During idling, combustion chamber temperatures drop and fuel may not burn completely. Unburned fuel will dilute the crankcase oil, reducing its viscosity and its ability to protect the engine.

Before moving the Sweeper, **be sure** the Parking Brake is released to prevent premature wear and possible failure of the brake shoes.



OPERATION

CONTROLS

For best overall sweeping results, it is important that the operator be familiar with **all** Challenger II Hydrasweep controls and recommended procedures **before** proceeding.

In the following paragraphs, the item numbers listed in () refer to pages 3.3 and 3.4 in this section, which illustrate the location of operator controls.

GENERAL DESCRIPTION

Engine Throttle - The engine throttle (item 3) is located on the left of the driver's seat with a friction detent linkage control. This allows the operator to set any desired engine RPM without maintaining pressure on the control. When first operating this machine, set the throttle to 1/2 or 3/4 open until you are familiar with the functions of the controls.

Travel Pedal - The hydrostatic Travel Control Pedal (item 1) is a foot operated pedal on the right side of the operator's platform. With some experience an operator should be able to operate this control, along with the throttle, to make the forward or reverse movement of the Sweeper smooth and fluid-like.

Service Brake - The foot-operated Service Brake Pedal (item 2) is on the far right side of the operator's platform. The service brake may be overpowered by the hydrostatic drive. Always allow the Transmission Control Pedal to return to NEUTRAL as the service brakes are applied. Most operators do not use the foot brake. Instead they use the throttle and hydrostatic control to slow down, stop and change directions.

Steering - The steering wheel (item 5) is located directly in front of the operator's seat. Remember that steering operations take priority over brush operations (rotation, lift and swing) in situations where both are being attempted at the same time.

BRUSH CONTROLS

The Challenger II is equipped with the following controls to provide operation of the brush:

1. Brush Rotation Lever - The Brush Rotation Lever (item 6) is located to the left of the control panel. It is equipped with forward and reverse rotation settings.



Do not sweep in reverse unless unit is equipped with optional Reverse Sweeping Guards. Equipment can be damaged and bystanders can be injured from flying rocks and debris.

2. Brush Speed - Brush Speed is controlled and adjusted by changing the engine operating RPM.

3. Brush Swing - The Brush Swing Lever (item 7) is located on the operator's platform, to the right of the control panel. This lever controls the swing of the brush from center line position to 40° **left** of center and 40° **right** of center.

Operating Positions - The Brush Swing Lever has two directions of operation, forward and back, as well as a center detent position which acts as a "neutral" position. Pushing the Brush Swing Lever forward will swing the brush to the **left**. Pushing it down will swing the brush to the **right**.

4. Brush Lift - The Brush Lift Lever (item 8) is located on the operator's platform, to the far right of the control panel. This lever controls the height of the brush carrier frame and the brush itself.

Operating Positions - The Brush Lift Lever has four possible positions:

OPERATION

- A. **Up** - Pushing fully forward lifts the brush carrier. When pressure on the lever is released, the lever automatically returns to the "neutral" (or center) position.
- B. **Neutral** - This position holds the brush carrier at the height it was moved to by the last UP or DOWN operation of the Brush Lift Lever.
- C. **Down** - Pulling back on the lever forces the brush carrier down toward the ground. When pressure on the lever is released, the lever returns to the neutral position automatically, holding the brush in the desired position.
- D. **Float** - Brush float is obtained by pulling the Brush Lift Lever completely back where it has a detent position. It works best to move the lever VERY RAPIDLY to this position until it stops. The same applies when taking the lever out of FLOAT - move the lever VERY RAPIDLY back to the HOLD position.
5. **Brush Down Pressure Control** - The Brush Down Pressure Control knob is to the left of the control panel near the floor. This knob controls the amount of hydraulic pressure needed to keep the brush suspended over the work surface. Turn the valve clockwise to decrease the down pressure and counterclockwise to increase pressure. It is **important** to understand that by **increasing the hydraulic pressure** suspending the brush, you are **decreasing the down pressure** of the brush. The hydraulic pressure gauge registers the pressure holding the brush when in the FLOAT position. Brush Down Pressure Control only works with the Brush Lift in the FLOAT position as described in item "D" above.

Do Not apply excessive Down pressure on the brush. The brush can stall when it is forced down with excessive force. Poor sweeping action and excessive brush wear will result. For best results, operate in the FLOAT position and use the Brush Down Pressure Control. Refer to



BRUSH DOWN PRESSURE CONTROL under BRUSH CONTROLS in this section to correct excessive down pressure.

CONTROL under BRUSH CONTROLS in this section to correct excessive down pressure.

SWEEPING GUIDELINES

For best sweeping results, please observe the following recommended guidelines:

1. Sweep only with the tips of the brush bristles. This will provide maximum "flick" sweeping action. Control action can be obtained by using the **Brush Down Pressure Control Valve**. See item 5 above.
2. The right combination of ground speed to brush speed will correct ineffective sweeping. For heavy sweeping, slow the ground speed and increase the brush RPM by increasing engine RPM.
3. To get an ideal brush height setting, sprinkle some sand under the brush and engage the brush with the machine in a stationary position. When the brush is raised, there should be a 2" to 4" wide clean swath under the entire length of the brush.
4. For most normal sweeping operations, the FLOAT position works best. Practice will help the operator achieve the most effective operation of the Challenger II.
5. Keep the rubber brush apron, located in front of the brush, in good working order and in

OPERATION

place while sweeping. The brush apron protects the front of the unit, as well as oncoming traffic and bystanders, from flying debris.



***Do not** apply excessive Down pressure on the brush. The brush can stall when it is forced down with excessive force. Poor sweeping action and excessive brush wear will result. For best results, operate in the FLOAT position and use the Brush Down*

Pressure Control knob. Refer to BRUSH DOWN

PRESSURE CONTROL under BRUSH CONTROLS in this section to correct excessive down pressure.

6. **Water Spray System** - In certain conditions, it may be necessary to sweep using the optional Water Spray System to control dust. This system consists of a 150 gallon poly tank with mounting strap, an electric pump and a corrosion resistant spraybar and piping system. The pump is turned on by a switch on the operator's dash panel.

SHUT DOWN

When it is necessary to leave the Challenger II for any extended period of time:

1. Place transmission in neutral.
2. Stop rotation of the brush and use mechanical brush lift cylinder lock to secure brush in the raised position. This will prevent a flat spot from forming on the brush bristles. **Be sure** to do this if the unit will be parked for an extended period.
3. Set the parking brake.
4. Idle the engine a few minutes before shutting it down.
5. Remove the ignition key to prevent unauthorized operation.
6. Lock any optional panels, cab doors, spare tire etc. before leaving the machine unattended. This will help prevent theft and/or vandalism while machine is not in use.

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MAINTENANCE

GENERAL MAINTENANCE

The suggestions and recommendations contained in this manual for maintenance should be followed as closely as possible to obtain long life and best performance from the ROSCO Challenger II Road Sweeper.

PROPERLY MAINTAINED EQUIPMENT IS SAFE EQUIPMENT! The user of this product is responsible for inspecting the Challenger II daily, and for having parts replaced or repaired when continued use of the machine would cause damage or excessive wear to other parts. Daily inspection of the Challenger II should include inspecting for missing guards, loose bolts, fluid leaks, worn or damaged hoses, debris or dirt accumulations which could cause service or safety problems.

A PREVENTIVE MAINTENANCE CHART is included at the end of this section as a guide for establishing a Preventive Maintenance Schedule.

ENGINE MAINTENANCE

To access the engine compartment, pull the lock pins (located on either side of the operator's seat on the floor) back and lock open. To raise the cab, **be sure** the relief handle on the hydraulic jack on the left side of the cab is in the closed or up position. Use the jack to raise the cab. **Be sure** the safety bar under the cab is fully locked before working on the engine.

To lower the cab, disengage the safety bar by lifting on the handle attached to the safety bar and hold it up. Relieve pressure on the hydraulic jack by moving the jack relief to the open or down position and allow the cab to settle into place. **Be sure** to keep safety bar handle up so the cab may return to position. Allow slide pins to reengage to lock cab in place. **Be sure** the hydraulic jack handle is in the up position and the jack relief handle is in the closed or up position to hold the jack handle in place.

In addition to the following maintenance recommendations, please also consult the engine manufacturers Operation & Maintenance Manual for detailed instructions. A copy of this manual was provided with the Challenger II at the time of its shipment from the factory. If additional copies are needed, they can be obtained from ROSCO through your local authorized ROSCO dealer/distributor or through a local equipment dealer who sells or services the engine that your Sweeper is equipped with.

Fuel Requirements

Use only clean, good quality fuel specified to EN 590 or ASTM D975. If the Sweeper will be used often in cold weather conditions (below 40° F, 4° C), use blended fuels or No. 1-D fuel to prevent

gelling of the fuel filters. The use of No. 1-D fuel may reduce the engine's performance by approximately 10%.



Do not use contaminated fuel. Fuel contaminated by water or dirt can cause severe damage to engine components. Fuel tanks contaminated with water will promote the growth of microbes which form a "slime" that can clog fuel filters and lines.

Cold Weather Starting

If it is necessary to use ether as a starting aid, do it promptly. Read and follow the the ether manufacturer's recommendations for safe and effective use, and perform the following:

MAINTENANCE

ENGINE MAINTENANCE (cont'd)

1. Place unit in neutral and set parking brake.
2. Set throttle to idle.
3. Have another person crank the engine while you spray starting fluid into the air cleaner for no more than two (2) seconds at a time. **Never** remove the air filter element and spray ether directly into the air inlet piping or the intake manifold.
4. Be sure that engine oil pressure is indicated on the gauge within 30 seconds after starting.



DANGER: *Never use ether near open flames or with pre-heater or glow-plugs. The combination can cause an explosion.*

WARNING: *Do not inhale ether starting fluid fumes, as they are harmful.*



Do not use excessive amounts (spray for more than two (2) seconds per time) of ether starting fluid when starting the engine. Too much ether starting fluid will cause engine damage.

Fuel Filter

Diesel engine injection systems use fuel for lubrication of close tolerance internal engine parts. Therefore, proper maintenance of the fuel filters and the fuel tank are required for continued top performance and to prevent damage to internal engine components.

The engine fuel filter is located on the left side of the engine. A drain valve is provided on the bottom of the fuel filter. Every 50 hours, or 2 weeks, use the valve to drain a small quantity of fuel from the fuel filter into a clean, clear container.

If water or contaminants are found in the fuel you drained, **DO NOT** attempt to start the engine.

Continue to drain fuel into the container until it runs clear.

If large amounts of contamination are found, drain the fuel tank until the lines run clear. Replace the filters and fill with fresh clean fuel and install.

The John Deere Engine manual provided with your Sweeper contains more detailed information on fuel system maintenance procedures.

Crankcase Oil

Check the engine crankcase oil level prior to each day's use of the Challenger II. Park the machine on a level surface when checking the oil to assure accurate measurements. When checking oil while the engine is warm, wait until the engine has been off for at least five minutes to allow oil to drain back to the crankcase.

The oil dipstick is located on the left side of the engine. If the oil measures below the "ADD" mark on the dipstick, add the proper amount of the oil specified in the John Deere engine manual. Use the dipstick to recheck the oil level. **Be sure** it doesn't measure above the crosshatch area on the dipstick.

Never operate the engine with the oil level below the "L" (Low) mark or above the "H" (High) mark.



Change the engine crankcase oil and oil filter after the first 100 hours of service and every 250 hours thereafter. Refer to the **Preventive Maintenance Chart** at the end of this section and/or the engine manufacturer's manual for engine oil recommendations.

Air Intake System

The heavy-duty engine air cleaner is mounted on top of the engine. A restriction indicator is mounted on the outlet side of the air cleaner assembly housing near the large inlet tube to the engine.

MAINTENANCE

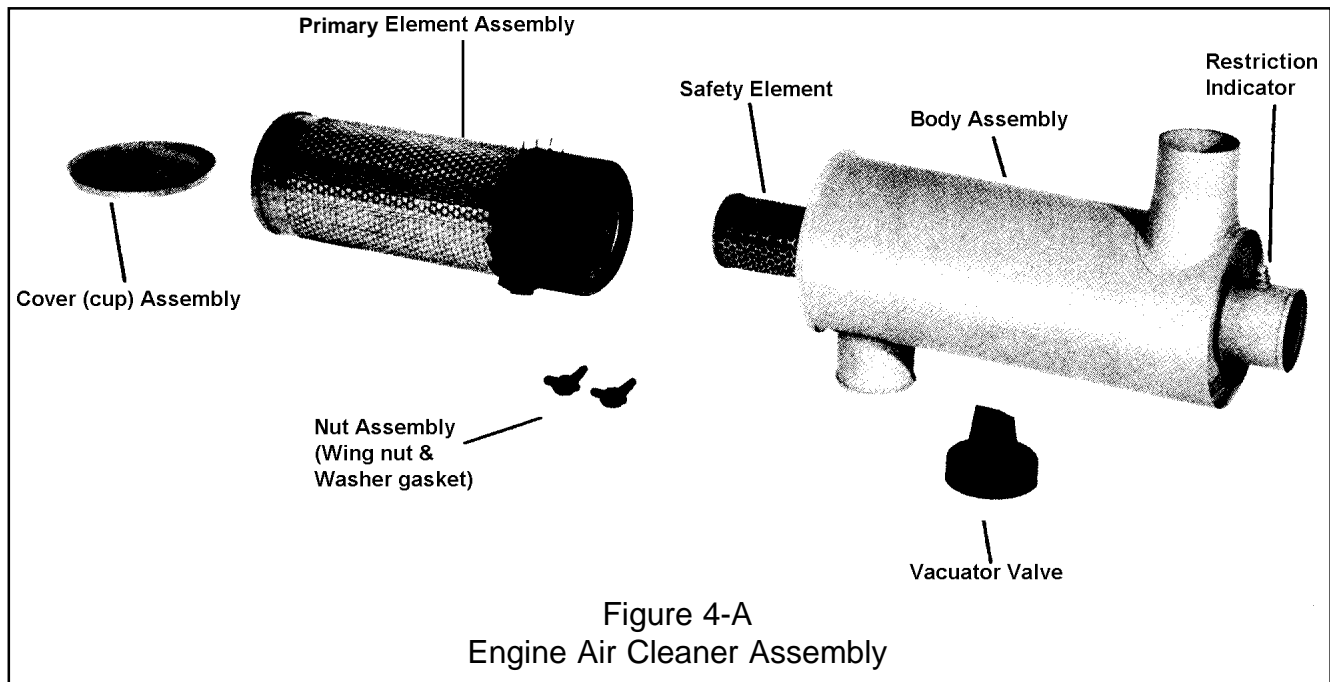


Figure 4-A
Engine Air Cleaner Assembly

ENGINE MAINTENANCE (cont'd)

Prior to daily operation, inspect all air intake system components for damage, cracked hoses, loose clamps etc.

Inspect the restriction indicator several times daily during operation (Figure 4-A). If the red indicator flag on the restriction indicator is visible, the air cleaner element must be replaced.



Be sure to clean the inside of the air cleaner body assembly **before** removing the Safety Element.

Before replacing any elements on the air filter housing, wipe the inside of the housing with a damp cloth. Reset the restriction indicator. **Be sure** not to introduce any contaminants into the engine intake tube. **DO NOT** replace the filter elements until the maintenance interval has been reached or the restriction indicator flag is visible.

When replacing body assembly or rubber adaptors, torque the T-clamp bolts to 50 inch pounds.

Replace the primary filter elements every 100 service hours. Replace the safety element during every third replacement of the primary element. Refer to **Section 6 (Parts Catalog)** or the **Preventive Maintenance Chart** in this manual for the correct Rosco part number.

The air inlet hood should not require maintenance or service unless visual damage is noticed.

Never operate the engine without an air cleaner. Destruction of internal engine components will occur in minutes.



Radiator and Coolant

Check the engine radiator daily for rocks and debris. A partially blocked radiator will reduce the efficiency of the radiator and cause overheating and premature failure of the engine or its components.

Compressed air can be used to remove rocks or debris from the radiator.

MAINTENANCE

ENGINE MAINTENANCE (cont'd)



Always wear eye protection when using compressed air. Flying debris can cause serious eye injury.

Check radiator coolant level prior to each day's use of the Challenger II. The coolant level when the engine is cold should cover the radiator core. The coolant level when the engine is warm should be at the bottom of the filler tube.

WARNING: Do not remove the radiator cap when engine is hot. Escaping hot coolant can cause serious burns. Add coolant to the radiator **only** when the engine is stopped and fully cooled.



Refill the cooling system when necessary with a mixture of 50% water and 50% ethylene-glycol antifreeze.

Seasonally, or after every 500 service hours, flush the cooling system. Consult the John Deere engine manufacturer's manual for recommendations on the type of cleaner and procedures to use for this operation.

Any good commercial automotive cooling system cleaning solution can be used. Before replacing the coolant after cleaning, consult the **Preventive Maintenance Chart** in this manual to find the total cooling system capacity for your engine. Prepare the coolant as recommended by the engine manufacturer and refill to the level as instructed above.

Battery

The Challenger II is equipped with a battery that is sized to provide efficient starting for the diesel engine on the machine. With proper maintenance, the battery will provide years of trouble-free service.

Starting an engine depends heavily upon good cranking speed. It is important that the battery

always be fully charged and that all cables and terminals are cleaned and properly connected to the battery.

Check the level of the battery electrolyte regularly. Add distilled water if necessary, but **DO NOT** overfill. Overfilling can cause poor performance or early failure. A maintenance free battery should rarely require additional electrolyte.

Keep the top of the battery clean. When necessary, wash with a baking soda solution (1 part baking soda to 4 parts water) and rinse with fresh water. **DO NOT** allow the soda solution to enter the battery cells.

Inspect the cables, clamps and hold-down bracket regularly. Clean and apply a light coating of grease when needed. Replace corroded, damaged parts if necessary.

CAUTION: Always disconnect battery ground (-) cable first and **always** reconnect the positive (+) battery cable first when servicing battery cables and when removing or replacing the battery. **Always** remove the ground (-) cable when welding on the machine.



If the battery becomes discharged repeatedly, check the electrical charging system. If the engine is difficult to start or the battery seems weak, clean and check the terminal connections. If the problem continues, use a battery tester to check the battery for voltage and current draw.

WARNING: Explosive gas may remain in and around the battery for several hours after charging. Sparks or flame can ignite this gas causing an explosion which could shatter the battery and cause serious personal injury. **Always** shut off the battery charger before disconnecting cables from the battery terminals.



MAINTENANCE

ENGINE MAINTENANCE (cont'd)

CAUTION: *Always wear eye protection when servicing batteries.*



If the Challenger II is to be stored for more than 30 days, remove the battery from the Sweeper and store it in a cool, dry place. During storage, keep the battery fully charged and check the level of the electrolyte regularly.

Engine Belts

Check the diesel engine belt for excessive wear, fraying and cracking. Auxiliary V-belt drives should also be inspected.

Adjust engine belt(s) as required to provide proper tension. Consult the John Deere diesel engine manufacturer's manual for correct tensioning instructions and specifications.

Your Challenger II may be equipped with an air conditioner with a V-belt drive. For proper operation, it is important to keep this belt tensioned properly.



DANGER: *Always shut down engine before adjusting belts. Severe injury can result if belts are adjusted while the engine is running.*

Installing New Belts

When installing new belts, always shorten the distance between pulley centers so the belt can be installed without force. Never roll the belt over a pulley and never pry it with a tool such as a screw driver. This will damage belts and cause early failure.

CAUTION: *Keep belt guards in place at all times. Severe personal injury may result from contact with turning belts and pulleys.*



MAINTENANCE

HYDRAULIC SYSTEM MAINTENANCE

The Challenger II hydraulic system consists of a variable displacement Sauer 90 Series pump and motor which provide drive power for the Road Sweeper. A Prince gear-type hydraulic pump is directly connected to the pump, and provides operational pressure for the power steering, brush lift and brush swing, as well as the brush drive.

The Challenger II has a 25 gallon hydraulic reservoir and filters in a complete hydraulic system. This manual contains general system maintenance guidelines, however, more detailed service and maintenance information is available directly from the hydraulic component manufacturers if necessary or desired.

The hydraulic oils on the chart, following, have been reviewed by ROSCO and are recommended as replacements. It is best to use the heaviest weight oil that can be safely used for the temperature range of machine operation. If your machine will **never** be used at temperatures below 0° F (-18° C), we recommend that you use a heavier weight oil. If you are considering using an oil that is not listed, contact your authorized ROSCO dealer/distributor or ROSCO's Factory Service Department to obtain the specifications that the hydraulic oil must meet to provide the needed lubrication and cooling for the unit's hydraulic components. The use of hydraulic oils or fluids that are not equal in quality to those listed could result in substandard performance or possible failure of the Challenger II hydraulic components.

HYDRAULIC OIL REQUIREMENTS AND APPROVED BRANDS FOR FIELD FILL

Hydraulic Fluid

Hydraulic oil must provide anti-wear properties that meet or exceed those found in the API (American Petroleum Institute) classification SD, SE or CC crankcase oil.



Do not mix manufacturers or grade weights when adding hydraulic oil.

Hydraulic oil viscosity must not fall below 70 SUS (13 cs) in the reservoir under the most adverse conditions. The best viscosity being 80-300 SUS (17 cs to 65 cs). The viscosity rating at the lowest expected start-up temperature should not exceed 10,000 SUS (2158 cs).

Be sure hydraulic oil selection is compatible with your hydraulic system.
Be sure to use mineral base hydraulic oil.
Be sure hydraulic oil selection assistance is from a reputable supplier.
Be sure the hydraulic specifications meet or exceed the following specifications.

Hydraulic oil must have rust and oxidation inhibitors that will maintain chemical stability. When changing the hydraulic oil with oil other than the factory fill oil, the hydraulic system must be completely drained. **Be sure** to purge or drain all hoses, cylinders, valves, motors and pumps of hydraulic oil. **All** hydraulic oil filters must also be changed at this time.

MAINTENANCE

HYDRAULIC FLUID CHART

AMBIENT TEMP. -25° F TO 80° F (-32° TO 27° C)	AMBIENT TEMP. -10° F TO 95° F (-23° TO 35° C)	AMBIENT TEMP. 0° F TO 105° F (-18° TO 41° C)
AMOCO RYKON 32	AMOCO RYKON 46	AMOCO RYKON 68
EXXON UNIVIS N32	EXXON UNIVIS N46	EXXON UNIVIS N68
GULF HARMONY 32 AW	GULF HARMONY 46 AW	GULF HARMONY 68 AW
MOBIL DTE 13M	MOBIL DTE 15M	MOBIL DTE 16M
PHILLIPS 66 MAGNUS A32	PHILLIPS 66 MAGNUS A46	PHILLIPS 66 MAGNUS A68
SHELL TELLUS 32	SHELL TELLUS 46	SHELL TELLUS 68
TEXACO 32	TEXACO 48	TEXACO 68
CHEVRON MV ISO 32	MOBILFLUID NO. 424	CONOCO 68

HYDRAULIC SYSTEM MAINTENANCE (cont'd)

Hydraulic Reservoir

The hydraulic reservoir is located in the engine compartment of the Challenger II on the right side of the machine. The fill cap is on top of the tank. The hydraulic reservoir has a sight gauge on the front to monitor hydraulic oil level.

Check the level of hydraulic oil prior to each day's operation of the Challenger II. Hydraulic oil should be visible in the sight gauge. If not, fill the tank until oil is visible in the sight gauge.

The fill cap strainer should be cleaned each time hydraulic oil is added or changed.



Use extreme caution when removing the filler cap to prevent any foreign matter from entering the hydraulic reservoir.

The filler cap should be padlocked in place when practical to eliminate the possibility of tampering.

Condensation may build up in the hydraulic

system and clog the filter elements. This condition can lead to insufficient hydraulic fluid at the pump which will in turn degrade the performance of, and possibly damage, the hydraulic pump and other system components.

Warm hydraulic system to above 100° F (38° C) and check filter indicators. If either filter indicator is in the RED, the filter element should be replaced. Refer to the **Preventive Maintenance Chart** at the end of this section for ROSCO part numbers for filter elements.

Note: The filter element(s) should be replaced using only genuine ROSCO replacement parts. Other parts could be substandard and cause hydraulic system failure. **The use of other than approved filter elements will void warranty on hydraulic system components.**

Drain and replace hydraulic oil and filters after the first 250 hours of service, and again after every 1200 hours of service, or seasonally, whichever comes first. Always use genuine ROSCO

MAINTENANCE

HYDRAULIC SYSTEM MAINTENANCE (cont'd)

replacement parts when changing the filter elements. Refer to the **Preventive Maintenance Chart** at the end of this section for part numbers. Drain the hydraulic oil by removing the plug. For convenience, a customer supplied drain hose can be attached to drain fluid into a container.

The suction strainers should be removed and cleaned at the 1200 hour service interval or whenever the hydraulic oil is changed. There is no need to remove and clean suction strainers at the 250 hour service interval.

Hydraulic System Checks

Prior to each day's use, inspect the Challenger II for hydraulic leaks. Each week, check to be sure that all hose fittings are secure and tight.

If leaking fluid is found, it is probably on the pressure side of the hydraulic system. Repair the leaking component **before** starting the Challenger II.

DANGER: *Never use your hand to locate hydraulic leaks. Hydraulic fluid under pressure will pierce the skin and is dangerous. Use a piece of wood or cardboard to locate leaks. If hydraulic oil pierces the skin, get **immediate** medical attention.*



DANGER: *Always wear eye protection when inspecting for leaks in the hydraulic system.*



Leaks on the suction side of the hydraulic system are more difficult to find. Symptoms of suction leakage which cause air and/or dirt to enter the system are:

- Foaming of hydraulic oil
- Sluggish hydraulic system operation
- Unusual noises in hydraulic pumps/ motors

This condition is serious since air or dirt in the

hydraulic system causes rapid component wear and eventual failure. To isolate the problem, perform the following:

1. Verify that all reservoir connectors and fittings are properly tightened.
2. If the problem persists, wrap the suction side hose and connectors with a high-quality electrical tape. Start at the pump inlet(s) and work towards the hydraulic reservoir.
3. If this technique isolates the leak, replace the defective hose assembly or fitting. **Never** attempt to repair hydraulic hoses and/or leave the tape attached.

Inspect the Challenger II occasionally during operation for hydraulic leaks which may only be noticeable while the unit is running.

Pumps and Motors

The hydraulic pumps and motors require no regularly scheduled maintenance. As stated above, frequent inspection for leaks will indicate the need for service of these components.

Adjusting Brush Rotation Relief Valve - The Brush Rotation circuit gets its hydraulic flow from the excess flow port of the hydraulic pump. The relief valve is built into the Brush Rotation Control Valve. This is the valve that controls the forward and reverse rotation of the brush drive motor. The valve is located on the right side under the front cab panel of the Challenger II. The Brush Rotation Relief Valve will need adjusting if:

- The brush stalls frequently or lacks sweeping power
- There is a constant noise while sweeping

It will be necessary to plumb in a 0 to 5000 psi gauge into the Brush Rotation Flow Circuit. To do this:

1. Start the engine and warm the hydraulic oil to at least 100° F (38° C).

MAINTENANCE

HYDRAULIC SYSTEM MAINTENANCE (cont'd)



CAUTION: Use extreme caution when working under the Challenger II while adjusting Brush Rotation hydraulic pressure. Have another person who is familiar with the machine assist you.

2. Set the parking brake and put the transmission in neutral. Use the foot brake as an extra precaution.
3. Engage the Brush Rotation Control handle to turn the brush in the forward direction.
4. Increase engine speed to 2500 RPM.
5. Lower the brush to the ground using FULL DOWN PRESSURE and stall the brush.
6. Take a pressure reading. The pressure gauge should read 2400 +/- 100 psi.
7. Raise the brush and disengage the Brush Rotation Control lever.
8. Adjust the relief valve by removing locknut and turning the adjusting screw clockwise to increase pressure and counterclockwise to decrease pressure. Turn the adjusting screw in 1/8 turn increments and repeat steps 4 through 6 until correct pressure is obtained.

Adjusting Brush Control Relief Valve - The Brush Control gets its hydraulic flow from the power beyond port on the steering orbital. The relief valve is built into the Brush Control Valve. This is the valve that controls the brush pivot and lift cylinders. The valve is located on the left side under the front cab panel of the Challenger II. The Brush Control Relief Valve will need adjusting if:

- The brush lifts slowly or not at all
- There is a constant noise when pivoting or lifting the brush

It will be necessary to plumb a 0 to 5000 psi gauge into the Brush Control flow circuit. To do this:

1. Start the engine and warm the hydraulic oil to at least 100° F (38° C).

CAUTION: Use extreme caution when working under the Challenger II while adjusting Brush Control hydraulic pressure. Have another person who is familiar with the machine assist you.



2. Set the parking brake and put the transmission in neutral. Use the foot brake as an extra precaution.
3. Increase engine speed to 2500 RPM.
4. Raise the brush to the full extent of the cylinder travel.
5. Take a pressure reading. The pressure gauge should read 1500 +/- 100 psi.
6. Lower the brush.
7. Adjust the relief valve by removing locknut and turning the adjusting screw clockwise to increase pressure and counterclockwise to decrease pressure. Turn the adjusting screw in 1/8 turn increments and repeat steps 3 through 5 until correct pressure is obtained.

MAINTENANCE

ELECTRICAL MAINTENANCE

The Challenger II electrical system is protected from overload damage by fuses. Should an electrical component fail to operate, check the fuse panels first to make sure that a fuse is not blown. The fuse panels are located under the front control panel on the left side as you view the panel. Refer to Figures 4-F and 4-G for replacement fuse sizes and location. Fuses that blow may be replaced, but will continue to blow until the cause of the overload is found and corrected.



Always replace a blown fuse with the same rating as specified. **Never** replace with a higher amperage rating. Severe wiring damage and possible fire could result.

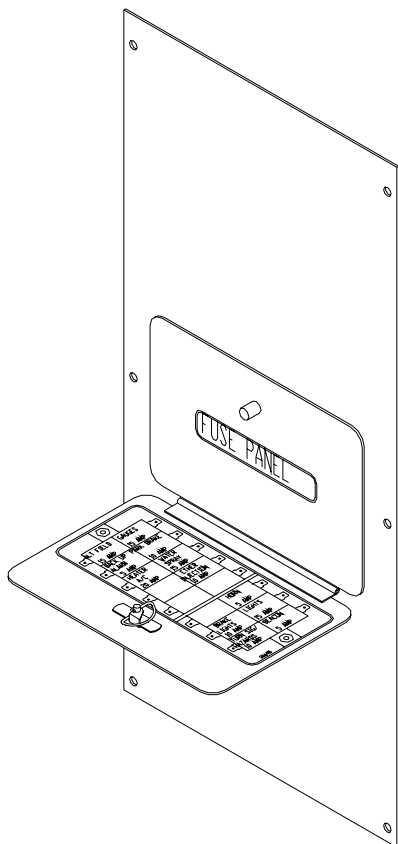


Figure 4-F

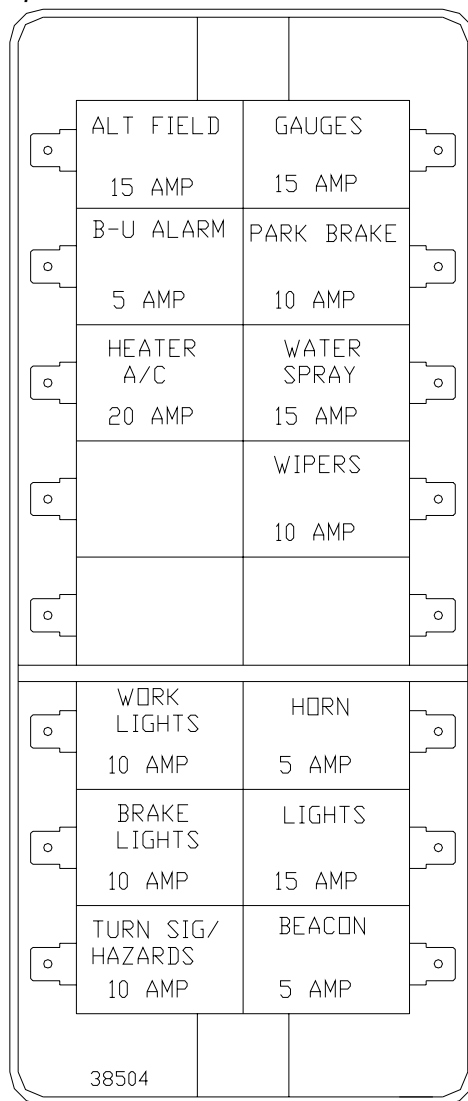
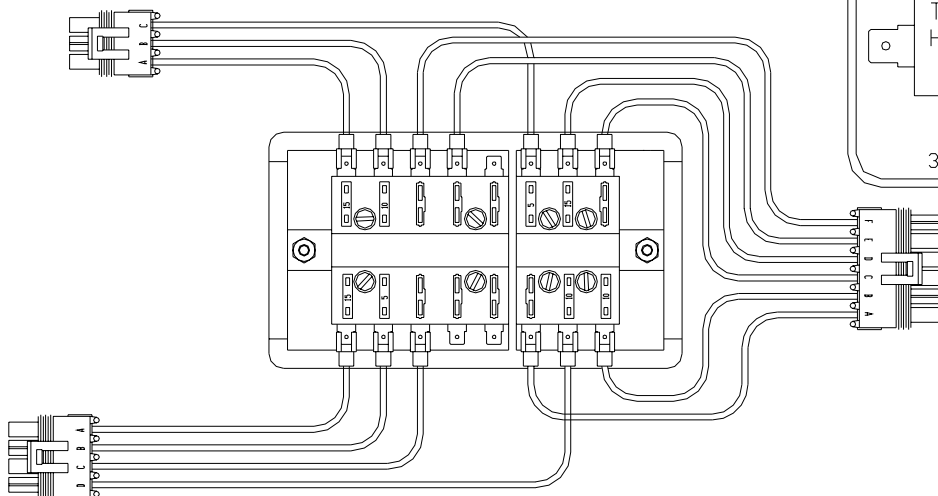


Figure 4-G

MAINTENANCE

BRUSH SYSTEM MAINTENANCE

Grease the brush core shaft pillow block bearing and brush lift pivot bushings daily using a multi-purpose grease.

Grease the brush swing pivot bushings with a multi-purpose grease every 100 hours.

To Change the Brush Wafers:

1. Lower the brush completely to the ground but **do not** put pressure on the brush. Put unit in neutral and set parking brake and leave engine running at idle speed.

2. Remove cover latch pins (one on each side). Unhook brush cover rubber hooks (one on each side). Raise cover and lay back to expose brush.

3. Remove hair pin clip from the Quick Change cylinder pin. Lift pin to remove the cylinder lock bar. Swing bar away from cylinder and reinsert pin.

4. Remove the handle lock on the Quick Change valve handle.

5. Position yourself to the back of the brush frame and pull the Quick Change valve handle out towards you slowly to open the brush carriage and remove the Idle Hub (right side).

6. Step to the right side of the brush core and pull the core away from the Drive Hub (left hub) and slide it out of the way.

7. Check both hubs for any damage and grease the U-joint on each hub.

8. Slide new brush on to slotted Drive Hub (left hub) making sure that the guide inside the brush core goes onto the Drive Hub side.

9. Align the Idle Hub with the smooth end of the brush core and push the Quick Change valve handle slowly to reinsert the Idle Hub (right side) into the brush core. Carefully guide the hub by hand if necessary to start into the core center.

Keep hands away from pinch points.

Note: Brush carriage may have to be raised slightly to install new core if old brush core was well worn.

10. Once Idle Hub is fully engaged, replace lockbar on the cylinder. Be sure pin is fully locked and replace hairpin clip.

11. Replace brush cover and lock down with cover latch pins. Replace rubber hooks.

12. Replace lock on the Quick Change valve handle.

MAINTENANCE

CHASSIS & RUNNING GEAR MAINTENANCE

Check the drive shaft daily for loose bolts and wear. Grease the drive shaft universal joints and slip yoke every 100 hours of service using a multi-purpose grease.

Tires and Wheels

Check tires with an accurate gauge prior to each day's use. Repair or replace damaged tires to provide safe operation of the Challenger II.



Never operate the Challenger II with less than four wheels and tires installed. Tires should be inflated to 65 psi when tires are cold.

Never exceed tire manufacturer's maximum recommended inflation pressure.



Protect tires from contact with petroleum products and chemicals.



The drive shaft **must be removed** prior to towing or serious damage could result.

Wheel lug nuts should be checked for tightness weekly or prior to towing the Challenger II for considerable distances. Torque lug nuts to 85 ft-lbs.

Inspect the wheels for damage prior to each day's use. Replace bent or cracked wheels.

Axles and Brakes

Grease king pin bushings, tie rod ends, steering cylinder rod end and rear axle pivot bushings every 100 hours of service with a good quality chassis lube.

Inspect brake pad linings and drums after every 500 hours of operation or seasonally. Remove

wheel and hub. Inspect brake pad linings for excessive wear and proper operation. Linings should be replaced if they are 1/16" thick or less in the **thinnest** spot.

WARNING: Do not lie under the machine while it is supported only by a jack. Use jackstands on a solid surface to prevent tipping of the machine when it is raised. Block the remaining wheels to prevent rolling of the machine when it is raised.



Check brake fluid level daily. When filling the brake fluid reservoir, only fill to 1 inch below the top of the fill neck. To prevent fluid from leaking out the cap vent hole, locate the hole toward the rear of the machine when replacing the cap.

Adjust brakes after every 500 service hours or at the beginning of each season. Information on proper brake adjustment can be found in the brake manufacturer's manual. Only qualified technicians should perform brake adjustment.

Axle bearings should be removed, inspected and repacked with a high quality axle bearing grease after every 500 service hours or seasonally.

To reinstall bearings and hub, tighten the retaining nut until the wheel drags during hand rotation. Then back off the nut 1/8 of a turn and bend over the locking tab or install the cotter pin, depending on the design configuration.

Check the front axle every 500 hours or seasonally. The lube should be 1 inch below the plug hole. Add if necessary. Refer to the **Preventive Maintenance Chart** at the end of this section for lubricant specifications.

MAINTENANCE

OPTIONAL EQUIPMENT MAINTENANCE

Spraybar Water System

Clean the spraybar water system strainer daily to prevent nozzle clogging.

Inspect the spraybar water system daily to confirm operation of all nozzles on the spraybar.

If a spraybar nozzle becomes plugged, remove it from the bar, clean the nozzle slots, and replace. You may also pierce the small holes of the spraybar openings with wire. Be careful not to ream the nozzle opening as spray pattern will be affected.

At the end of each operating season (or more often if required), remove the end caps on the spraybar pipe and flush out the line and nozzles.

For storage in below freezing temperatures, make sure the water tank, strainer, pump and all lines are completely drained to prevent damage from freezing.

Lighting

If the Challenger II is equipped with a lighting system, inspect lights daily for proper operation. If a light or group of lights does not function:

1. Check the fuse panel located under the cover on front of the cab for a blown fuse. See Figure 4-G on page 4-12 for more information.
2. Examine all visible wiring connections, making sure that they are securely fastened.
3. If the light(s) still does not work, remove the lens from the light and inspect the bulb(s), replacing any that appear damaged or discolored.
4. If the trouble is not located, inspect the wiring harnesses for damage. Wiring schematics are provided in the **Parts Catalog** section of this manual to assist a repairman in troubleshooting the Challenger II electrical system.

If broken wires are found, solder them together and cover them with a shrink wrap plastic covering (preferred) or electrician's tape to prevent contamination of the solder joint by moisture.

After making repairs to a wiring harness on the Challenger II, **always** replace or repair the protective loom which covers the wiring to prevent future damage to the wiring harness. Examine the routing of the harness and make sure that it is not subjected to the type of excessive movement which causes broken wiring.

PREVENTIVE MAINTENANCE CHART

Identifying Codes: I = Inspect L = Lubricate R = Replace
 A = Adjust S = Service

MAINTENANCE INTERVAL

ITEM	Daily	50	250	600	1200	CAPACITY	PART NUMBER	TYPE
		Hours (2 wks)	Hours	Hours (12 mo.)	Hours (24 mo.)			
Engine Oil	I	-	R	-	-	9 qts (8.5 l)		SAE 10W40 (See Engine Manual)
Engine Oil Filter *	-	-	R	-	-	-	38309-07	Cartridge Filter
Engine Belt(s)	I	-	-	I/A	-	-	38396	V-Rib Belt
Engine Air Filters	I	-	-	I/R	-	-	Primary > 38385-01 Safety > 38385-02	Dry Type Cartridge Filters
Engine Fuel Filters	-	I	-	R	-	-	Final > 38309-06 In-Line > 38217	Cartridge In-Line Filter
Engine Coolant	I	-	-	-	R	16 qts (15.14 l)	90599	50/50 Antifreeze
Hydraulic Oil	I	-	R	-	R	30 gals (113.56 l)	90735	(See chart on page 8)
Hydraulic Filters	I	-	R	-	R	-	38332-01	Cartridge Filters
Service Battery	-	-	I/S	-	-	-		
Clean Crank Case Vent Tube	-	-	-	I/S	-	-		
Cooling System	-	-	-	-	I	-		
Pressure Test Cooling System	-	-	-	-	S	-		
Flush Cooling System	-	-	-	-	S	-		

*** Change the engine oil after 100 hours maximum of (break-in) operation, then every 250 hours thereafter.**

NOTE: Check and adjust the engine valve clearance every 2000 hours. See Engine Manual for more information on this and other maintenance items.

Challenger II

PREVENTIVE MAINTENANCE CHART

Identifying Codes: I = Inspect L = Lubricate R = Replace
 A = Adjust S = Service

MAINTENANCE INTERVAL

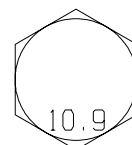
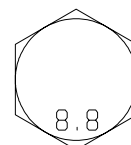
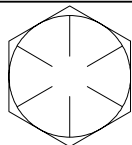
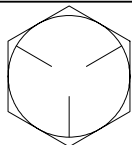
ITEM	Daily	50	100	250	500	CAPACITY	PART NUMBER	TYPE
		Hours (2 wks)	Hours	Hours (12 mo.)	Hours (24 mo.)			
Steering Axle Pivot	-	-	L	-	-	-	-	Multi Service Grease
King Pins,Tie Rods	-	-	L	-	-	-	-	Multi Service Grease
Steering Rod End	-	-	L	-	-	-	-	Multi Service Grease
Steering Axle Brgs	-	-	-	-	I/L	-	-	Wheel Bearing Grease
Driveshaft	-	-	-	-	I/R/S	-	-	
Brake Fluid	I/S	-	-	-	-	-	90707	D.O.T. 3 Approved Only
Front Brake Linings	-	-	-	-	I/R/S	-	-	
Drive Axle	-	-	-	-	I/L	8 lbs	91464	90W Gear Lubricant (limited slip)
Brush Shaft Brg	L	-	-	-	-	-	-	Multi Service Grease
Brush Lift Bshgs	L	-	-	-	-	-	-	Multi Service Grease
Brush Swing Brgs	L	-	-	-	I/L	-	-	Multi Service Grease
Charge Pump Filter	-	R	-	R	-	-	34464	Cart Filter

Notes:

BOLT TORQUE CHART

The table below gives correct torque values for various **NON-LUBRICATED** bolts. **DO NOT** lubricate bolts unless otherwise specified in this manual. Check tightness of bolts periodically, using this table as a guide. **ALWAYS** replace hardware with an equal strength fastener. When using locking fasteners, increase torque values by 5%.

BOLT IDENTIFICATION BY HEAD MARKINGS:



BOLT SIZE	ENGLISH				METRIC			
	GRADE 5 FT-LB N-M		GRADE 8 FT-LB N-M		CLASS 8.8 FT-LB N-M		CLASS 10.9 FT-LB N-M	
M6	--	--	--	--	7	10	11	15
1/4	9	12	12	17	--	--	--	--
5/16	19	25	27	36	--	--	--	--
M8	--	--	--	--	18	25	26	35
3/8	33	45	45	63	--	--	--	--
M10	--	--	--	--	37	50	52	70
7/16	53	72	75	100	--	--	--	--
M12	--	--	--	--	66	90	92	125
1/2	80	110	115	155	--	--	--	--
M14	--	--	--	--	103	140	148	200
9/16	115	155	165	220	--	--	--	--
5/8	160	215	220	305	--	--	--	--
M16	--	--	--	--	166	225	229	310
3/4	290	390	400	540	--	--	--	--
M20	--	--	--	--	321	435	450	610
7/8	420	570	650	880	--	--	--	--
M24	--	--	--	--	553	750	774	1050
1	630	850	970	1320	--	--	--	--
M30	--	--	--	--	1103	1495	1550	2100

TROUBLE SHOOTING

Engine Doesn't Crank.....	5.2
Engine Cranks, Won't Start (No Smoke From Exhaust).....	5.2 - 5.3
Engine Difficult to Start or Won't Start (Exhaust Smoke Present)	5.3
Unit Doesn't Move or Moves in One Direction Only	5.3 - 5.4
Unit Jerks When Operating in Forward or Reverse	5.4
Engine Power Output Low	5.4 - 5.5
Steering is Difficult.....	5.5
Hydraulic System Overheats (Above 220° F).....	5.5 - 5.6
Engine Oil Pressure Low	5.6
Engine Coolant Temperature Above Normal	5.6 - 5.7
Alternator Not Charging	5.7
Instruments or Tachometer Won't Work.....	5.7
Engine Won't Shut Off	5.7 - 5.8
Brush Stalls or Lacks Power.....	5.8

TROUBLESHOOTING

The following Troubleshooting Guide includes some problems that an operator may encounter during the course of operating the Challenger II. It also includes some acceptable corrections to these problems. Unless otherwise noted, the problems listed here are those which an operator can diagnose and repair. See an Authorized ROSCO Dealer/Distributor for diagnosis and repair of problems **not** listed. For specific engine and hydraulic problems not covered by this guide, please refer to the Engine or Hydraulic Pump/Motor Manufacturer's manual.



DO NOT Attempt to Service or Repair Major Components, such as Engine, Hydrostatic Pump or Motor unless authorized to do so by your ROSCO Dealer/Distributor. ANY UNAUTHORIZED REPAIR WILL VOID THE WARRANTY.

When a problem occurs, don't overlook the simple causes. For example, a starting problem could be caused by something as simple as an empty fuel tank. After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem.

Problem	Cause	Solution
Engine Doesn't Crank	Battery is weak or dead	Charge or replace battery
	Neutral start switch not activated	Put direction control foot pedal in neutral
	Faulty ignition switch	Replace
	Faulty starter solenoid	Replace
	Faulty starter	Repair or replace
Engine Cranks, But Won't Start (no smoke from exhaust)	No fuel in tank	Add fuel to tank
	No fuel to injector pump	Check fuel supply system
	Fuel filter plugged or restricted	Replace fuel filter

Problem	Cause	Solution
Engine Cranks, But Won't Start (cont) (no smoke from exhaust)	No voltage to fuel shutoff solenoid	Check fuel shutoff voltage. Voltage should be a minimum of 9 volts both with the ignition switch in the ON and START positions
	Fuel connections loose on suction side of injector pump	Tighten all fuel filter fittings and connections from the fuel tank to the injector pump
	Intake or exhaust system restricted	Check for and remove restrictions
Engine Difficult To Start or Won't Start (exhaust smoke present)	Engine cranking speed too low	Repair or clean battery terminal connection. Charge or replace battery.
	Insufficient supply of fuel to injector nozzles	Check fuel system. Clean or replace fuel filter
	Fuel solenoid defective	Check or replace defective fuel solenoid. See Engine manual.
	Fuel filter plugged	Replace fuel filter
	Air in the fuel system	Check for air leaks in the low pressure side of the fuel system. Prime fuel system. See Engine manual.
	Fuel supply contaminated	Verify by operating engine with a known fuel quality
	Intake air system restricted	Check for and remove restrictions
Unit Doesn't Move with Engine Running or Moves in One Direction Only	Parking brake engaged	Release parking brake
	Hydrostatic pump bypass valve open	The bypass valve is fully open at 2 revolutions. Close valve by turning clockwise and torque to 7 to 10 ft-lb (9.5 to 14 Nm). Overtorquing will damage valve.

Problem	Cause	Solution
Unit Doesn't Move with Engine Running or Moves in One Direction Only (cont)	Forward/Reverse relief valves are bypassing oil at low pressure	Repair or replace relief valves cartridge(s)
	Damaged hydrostatic pump	Repair or replace hydrostatic pump
	Damaged hydrostatic motor	Repair or replace hydrostatic motor
Unit Jerks when Operating in Forward or Reverse	Fast movement of direction control foot pedal	Move foot pedal slowly when changing speed and direction
	Parking brake not fully disengaged	Release parking brake and check for binding parking brake cable(s).
	Engine speed set too low	Run engine at higher RPM
	Low hydraulic fluid level	Fill reservoir with correct fluid to visible in sight gauge
	Air leaking into hydraulic system	Tighten or replace hoses, fittings or filter(s)
	Hydrostatic pump is malfunctioning	Repair or replace pump
Engine Power Output Low	Operating engine at high altitude	De-rate engine power output for altitudes above 1000 feet
	Air intake piping restricted or air cleaner element dirty	Remove restrictions clean or replace air cleaner elements
	Fuel suction line or fuel filter restricted	Check fuel line for restrictions. Replace fuel filter element(s)
	Fuel return system restricted	Check or correct restricted fuel return system
	Fuel quality poor	Verify by operating with a known fuel quality
	Fuel transfer pump malfunctioning	Check or replace fuel transfer pump. See Engine manual.

Problem	Cause	Solution
Engine Power Output Low (cont)	Throttle improperly adjusted	Check or adjust throttle controls
	Injector malfunctioning	Check or replace injector. See Engine manual.
Steering is Difficult	Low hydraulic fluid level.	Add fluid to proper level. See Maintenance section.
	Hydraulic reservoir return filters contain contamination.	Check return filter(s) for contamination and replace if necessary. See Maintenance section.
	Worn hydraulic pump.	Check for worn pump and repair or replace if necessary
	Worn steering orbitrol motor.	Check for worn steering orbitrol motor and repair or replace if necessary
	Worn steering cylinder	Repair or replace steering cylinder
Hydraulic System Overheats (Temperature above 220° F)	Low hydraulic fluid level	Fill with correct fluid to visible in sight gauge
	Defective optional hydraulic fluid temperature gauge or sender giving wrong temperature reading	Replace gauge or sender
	Brush Drive relief valve set too low or defective	Adjust relief valve to 2400 psi or replace if defective. See Maintenance section.
	Excessive ambient air temperature and high duty cycle	Operate unit at slower ground speed and maximum engine RPM during hot weather
	Plugged fins on fluid cooler	Clean fins and correct any other problems with cooling air flow

Problem	Cause	Solution
Hydraulic System Overheats (cont) (Temperature above 220° F)	Hydrostatic pump bypass valve defective or open	Repair or replace. If valve is open, turn valve clockwise until seated and torque to 7 to 10 ft-lbs (9.5 to 14 Nm). Overtorquing will damage valve.
	Worn hydrostatic pump	Repair or replace
Engine Oil Pressure Low	Electrical power not being supplied to gauge	Check fuse
	Incorrect oil level	Check for oil leaks. Add or drain engine oil. Check dipstick calibration.
	Oil filter plugged	Change full flow oil filter
	Oil diluted with fuel	Check or replace injector, fuel transfer pump or injection pump
	Oil diluted with coolant	See authorized engine repair facility
	Incorrect oil specifications	Change oil and check oil specifications. See Maintenance section and engine manual
	Oil pressure sender or gauge malfunctioning	Replace oil pressure sender or gauge
Engine Coolant Temperature Above Normal	Coolant level too low	Add coolant
	Radiator fins damaged or obstructed with debris	Inspect radiator fins, clean, repair or replace
	Collapsed or restricted radiator hose	Inspect hoses, replace if necessary
	Loose fan drive belt	Check belt tension and tighten if necessary
	Cooling fan shroud damaged or missing	Inspect shroud. Repair, replace or install as needed

Problem	Cause	Solution
Engine Coolant Temperature Above Normal (cont)	Incorrect or malfunctioning radiator cap	Check the radiator cap. Replace if necessary
	Temperature gauge or sender malfunctioning	Repair or replace sender or gauge
	Thermostat stuck in closed position	Test thermostat. Replace if necessary
	Dirt, scale or rust in the cooling system	Clean cooling system
Alternator Not Charging	Loose wiring or faulty connection	Repair or replace loose wiring or connector
	Diode at alternator loose or faulty	Tighten connection or replace diode
	Alternator belt loose or broken	Adjust or replace belt
	Alternator malfunctioning	Replace alternator
Instrument(s) Won't Work	Faulty gauge or sender.	Replace gauge or sender
	Alternator not charging	Repair wiring or replace alternator
	Faulty wiring	Check or replace wiring or connector
Engine Won't Shut Off	Electrical wiring fault supplying power to fuel solenoid when key is in OFF position	Check or repair wiring
	Faulty diode in engine wire harness at alternator	Check diode wire connection. Replace if necessary.
	Injection pump fuel solenoid inoperative.	Check solenoid for defects or foreign material inhibiting proper operations

Problem	Cause	Solution
Engine Won't Shut Off (cont)	Engine operating on fumes drawn into air intake.	Locate and isolate the source of fumes
	Low idle set too high	Set idle to specifications
Brush Stalls/Lacks Power	Brush Drive relief valve set too low or defective	Adjust relief valve to 2400 psi or replace if defective. See Maintenance section
	Sweeping with too much down pressure	See Brush Down Pressure Control in Operation section
	Ground speed too fast	Pull back on hydrostatic control lever and increase engine RPM to increase brush speed.

PARTS CATALOG

Standard - Illustrated:

Decal Group	6.2 - 6.7
Final Assembly	6.3
Cab Assembly	6.8 - 6.11
Suspension Seat Assembly	6.12 - 6.13
Chassis Assembly	6.14 - 6.15
Steering Assembly	6.16 - 6.17
Hydraulic Assembly	6.18 - 6.23
Fuel Assembly	6.24 - 6.25
Air Conditioning / Heat	6.26 - 6.29
Instrument Panel Assembly	6.30 - 6.32
Standard Instruments	6.30
Fuse Panel Sub-Assembly	6.33
Fuse Panel Assembly	6.34 - 6.35
Engine Sub-Assembly	6.36 - 6.37
Air Cleaner Assembly	6.38 - 6.39
Standard Air Inlet Hood	6.38
SY-Klone Precleaner	6.38
Turbo Precleaner (optional)	6.38
Exhaust Assembly	6.40
Throttle Assembly	6.41
Radiator Assembly	6.42 - 6.43
Hydraulic Brake Assembly	6.44 - 6.45
Travel Control Assembly	6.46 - 6.47
Steering Wheel Assembly	6.48
Park Brake Assembly	6.48 - 6.49
Brush Lift Frame Assembly	6.50 - 6.51
7 Foot Brush Frame Ass'y	6.52 - 6.55
8 Foot Brush Frame Ass'y	6.56 - 6.58
Mirror Assembly	6.59
Water Spray Assembly	6.60 - 6.61

Standard - Non-Illustrated Groups:

Wiring Assembly	6.62
Windshield Wiper Assembly	6.62
Wheel Assembly	6.62
Windshield Washer Assembly	6.62
West Coast Mirrors	6.62
Lighting Assembly	6.63
Amber Strobe Light	6.63
Amber Rotating Beacon	6.63
Battery Assembly	6.63
Defrost Fan Assembly	6.63

Options - Illustrated:

Bumper Weight	6.64
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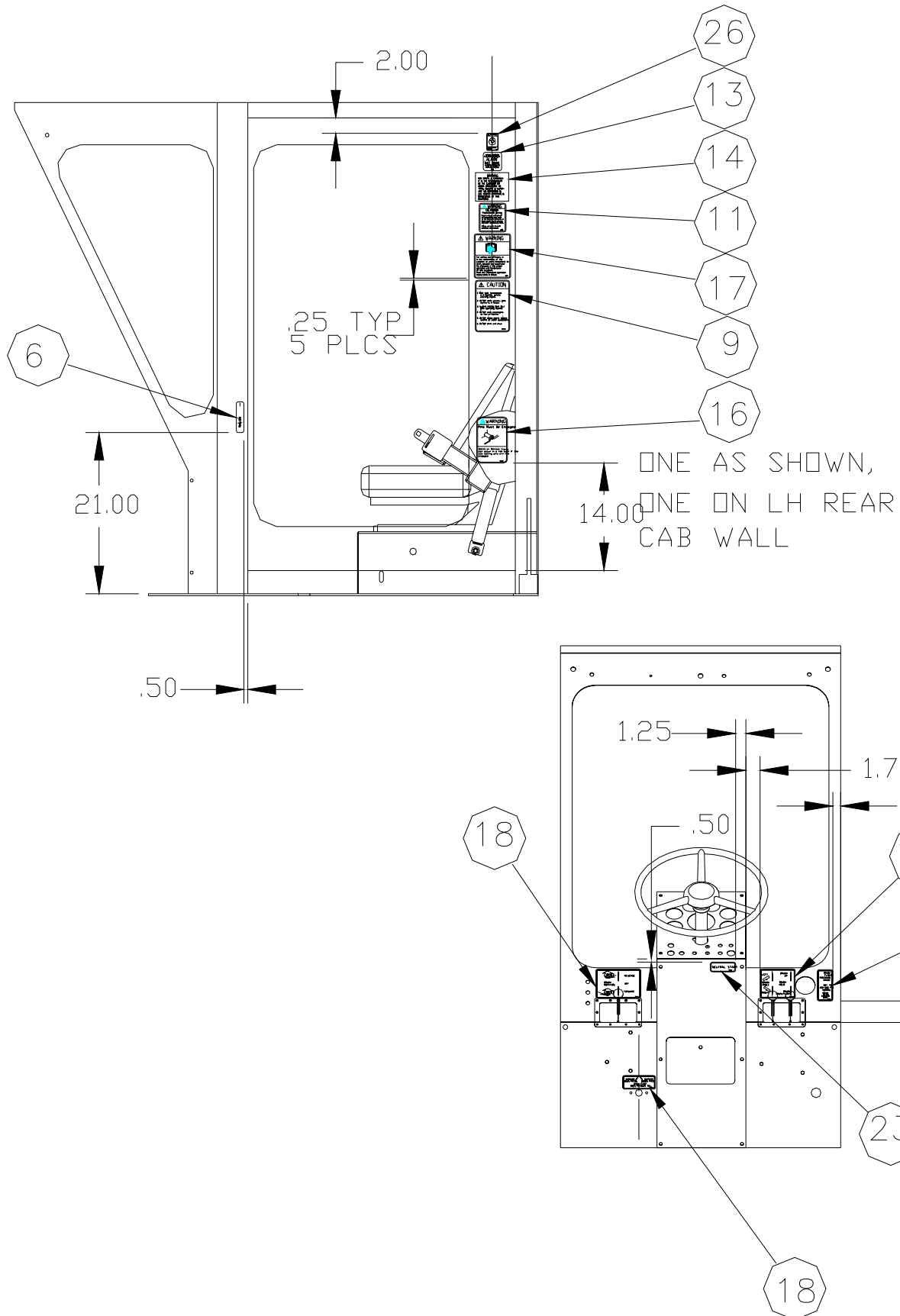
Options - Non-Illustrated Groups:

Brush, 7 Foot, Poly	6.65
Brush, 7 Foot, Poly/Steel	6.65
Brush, 8 Foot, Poly/Steel	6.65
Inside Rear View Mirror Group	6.65
Front Work Lights	6.65
Engine Shutdown Group	6.66
Engine Alarm Group	6.66
Gauge Group, Hydraulic Oil Temperature	6.66
Alphabetic Index	6.68 - 6.75

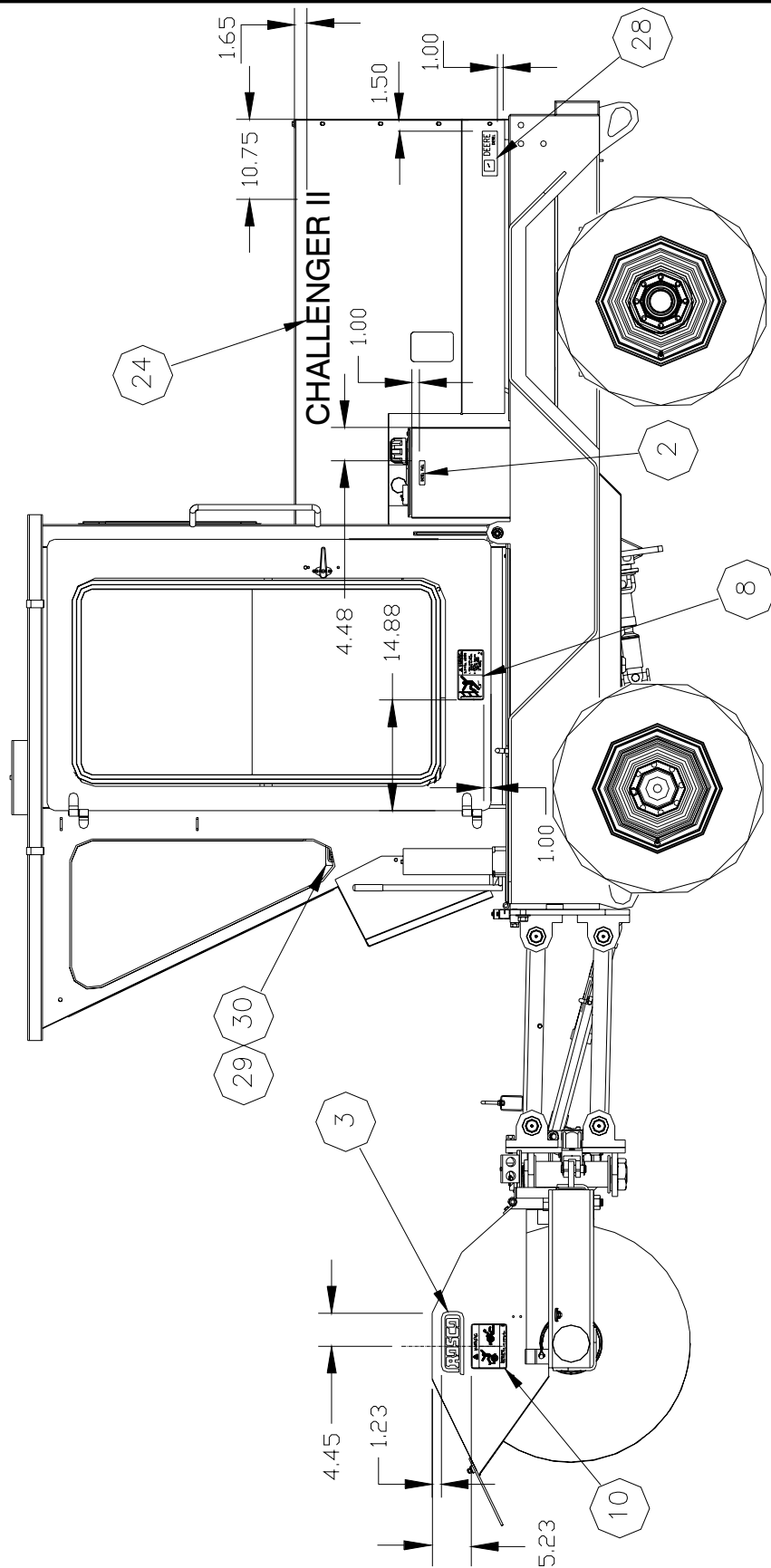
Schematics: (End of Section)

JD Engine Wire Harness
Wiring Schematic
Hydraulic Schematic
Air Conditioning/Heater Kit
Instrument Panel Assembly

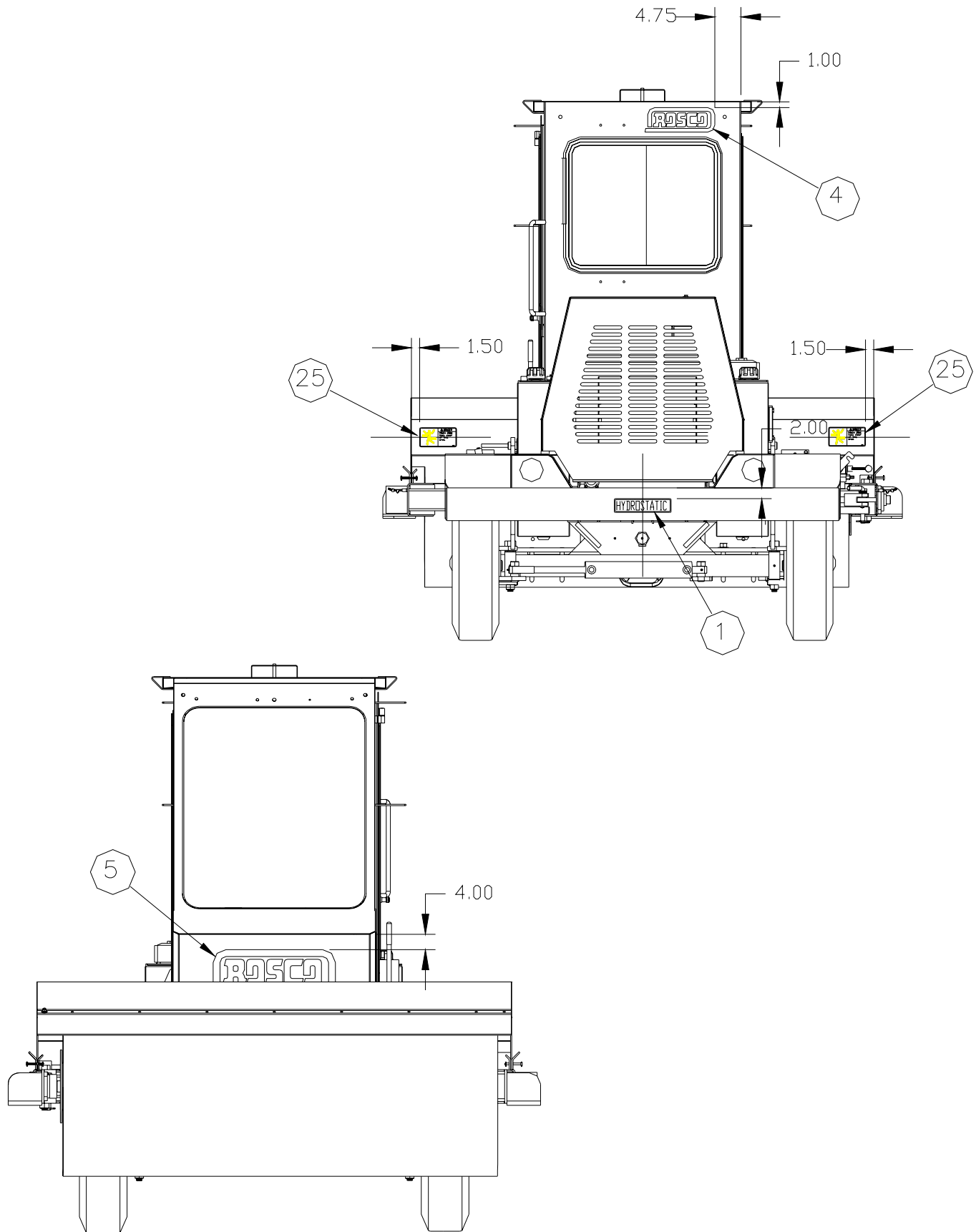
ITEM	PART NO.	QTY.	DESCRIPTION
	26309	REV. F	DECAL GROUP
1	D7	1.00	DECAL, HYDROSTATIC
2	D36	1.00	DECAL, DIESEL FUEL
3	D48	2.00	DECAL, ROSCO LOGO, SMALL, BLACK
4	D50	1.00	DECAL, ROSCO LOGO, MEDIUM, BLACK
5	33908	1.00	DECAL, ROSCO LOGO, LARGE, BLACK
6	34618	1.00	BRAKE DECAL
7	72590	1.00	DECAL, HOT FLUID HAZARD, WARNING
8	36202	1.00	DECAL, WARNING, KEEP CLEAN
9	36726	1.00	DECAL, CAUTION, RB 48
10	36857	2.00	DECAL, WARNING, ROTATING BRUSH
11	37243	1.00	DECAL, WARNING, ENGINE EXHAUST
12	37684	1.00	DECAL, HYD OIL, FILL TO SCREEN
13	37763	1.00	DECAL, BACKUP ALARM
14	53495	1.00	DECAL, GENERAL INSTRUCTION
15	004684102	7.00	STRIP, ABRASIVE, 4"X60'ROLL, BLK
16	38264	2.00	DECAL, CAB ROLL OVER
17	72681	1.00	DECAL, WARNING, READ OPR MANUAL
18	38636	1.00	DECAL, CHAL2 CONTROLS
20	38257	1.00	DECAL, GREASE DAILY
21	38258	1.00	DECAL, OIL LEVEL
23	38261	1.00	DECAL, NEUTRAL START
24	38263	2.00	DECAL, CHALLENGER II
25	36193	2.00	DECAL, DANGER, PINCH ZONE
26	35946	1.00	DECAL, CAUTION, HEARING PROTECT
28	38309-15	2.00	DECAL, JD ENG.
29	35355	1.00	PLATE, SERIAL NUMBER, ROSCO
30	871080436	4.00	RIVET, BLIND, AL, .125, .188-.250
	26307	REV. H1	FINAL ASSEMBLY
	27191	1.00	W/M, SWING-OUT COVER
	80221	8.00	CSHH, .375-16X1.00, GR5
	80162	8.00	WASHER, SPLIT LOCK, .375
	80142	20.00	WASHER, TYPE A PLAIN, .375
	80038	6.00	NUT, HEX, .375-16
	38583	.10	ADHESIVE, BLACK CONTACT
	33630-1	13.00	STRIPPING, EDGE, .125
	38461	2.00	PIN, SAFETY SNAP, .312
	80192	3.00	CSHH, .250-20X.75, GR5
	80140	3.00	WASHER, TYPE A PLAIN, .250
	80350	1.00	NUT, FLEXLOC, .250-20, FULL, LT
	26883	1.00	BRACKET, FILTER LOCK
	35403	1.00	SLEEVE, ABRASION, NYLON, .71ID
	R135	1.00	GRIP, RUBBER, .625 ID
	35136-4	3.00	PLUG, HOLE, .500, FLUSH MT, PLSTC
	35136-5	4.00	PLUG, HOLE, .625, FLUSH MT, PLSTC
	37830	4.00	NUT, INSERT, .375-16, .027-.150, S

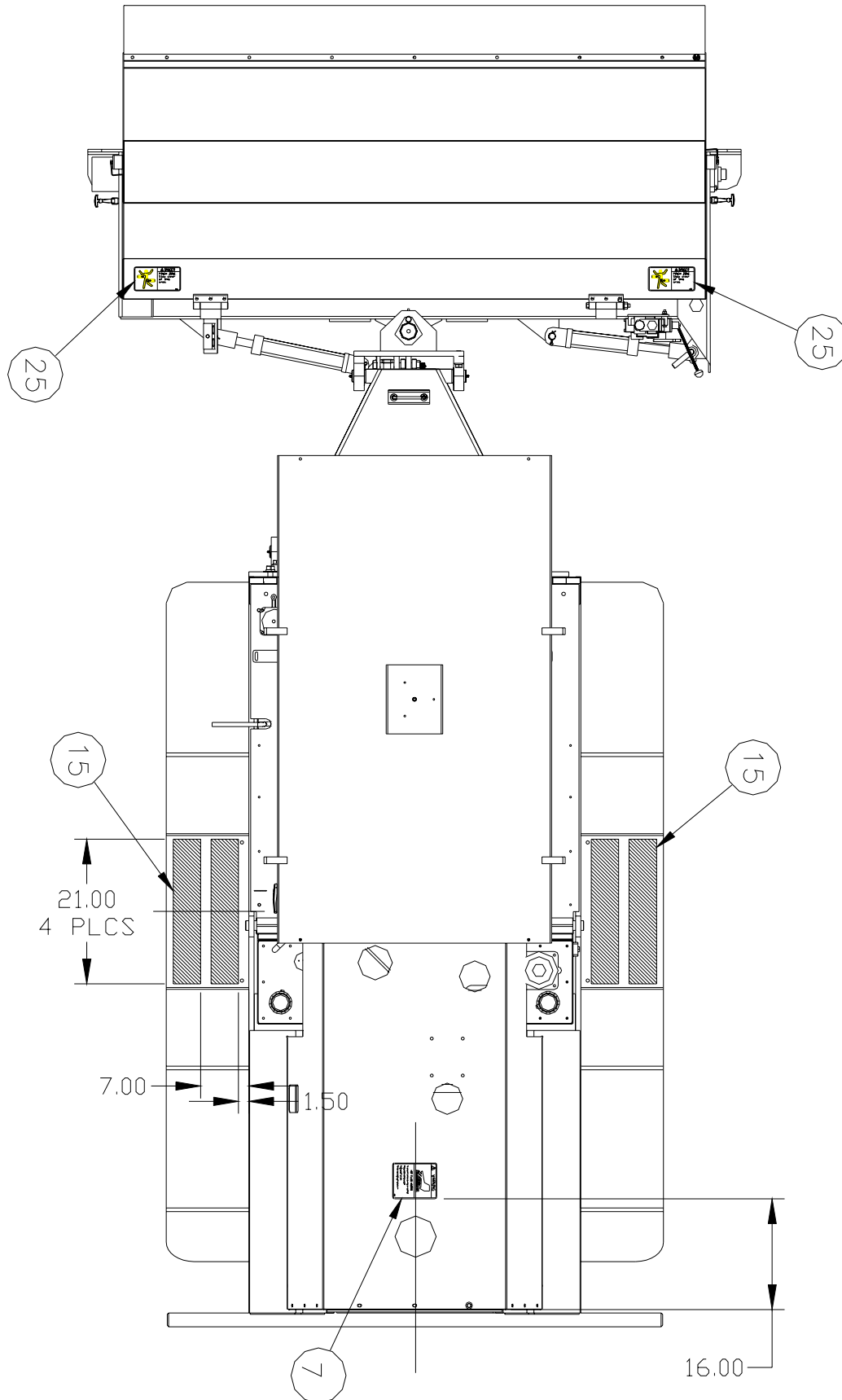


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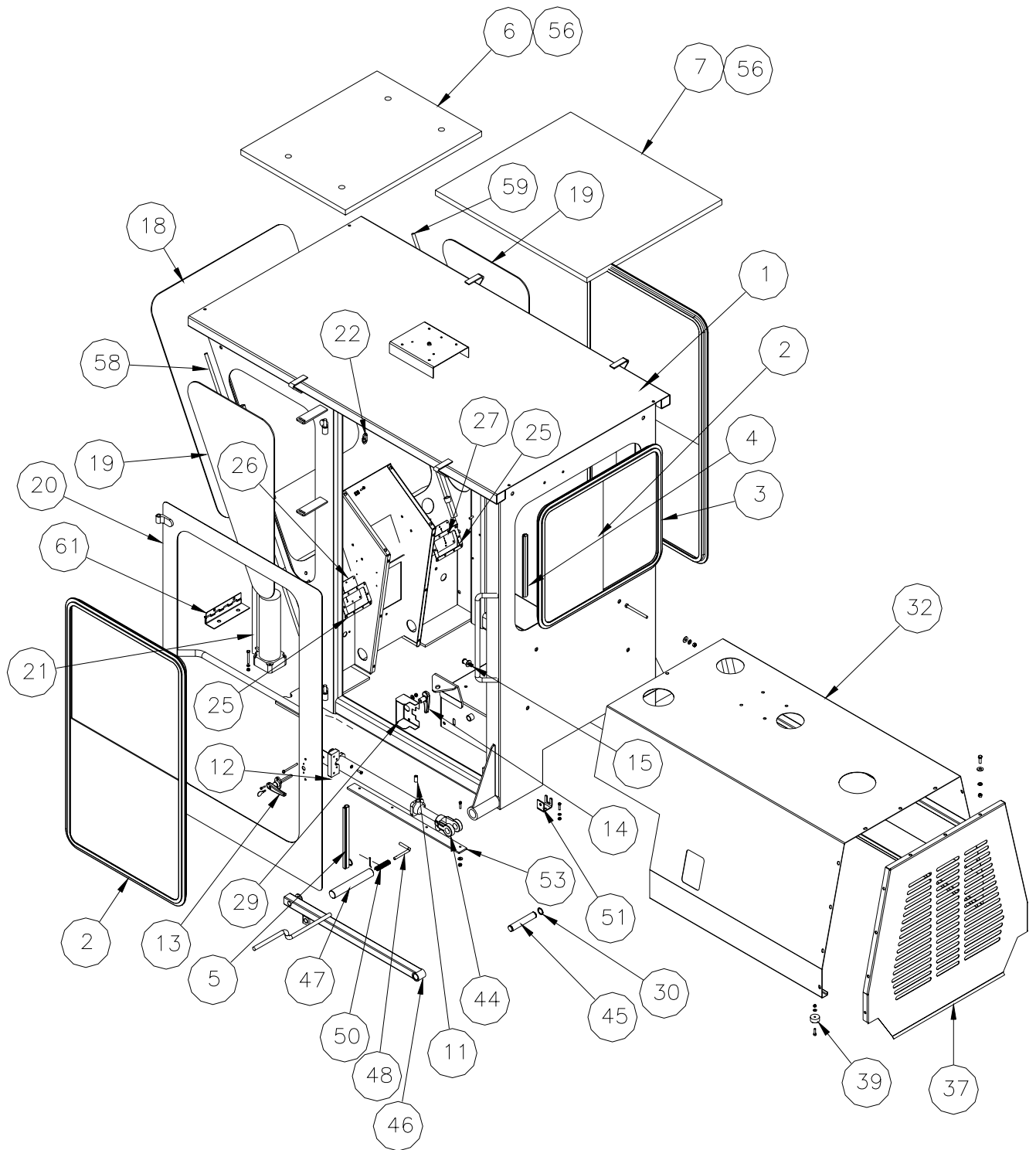


ITEM	PART NO.	QTY.	DESCRIPTION
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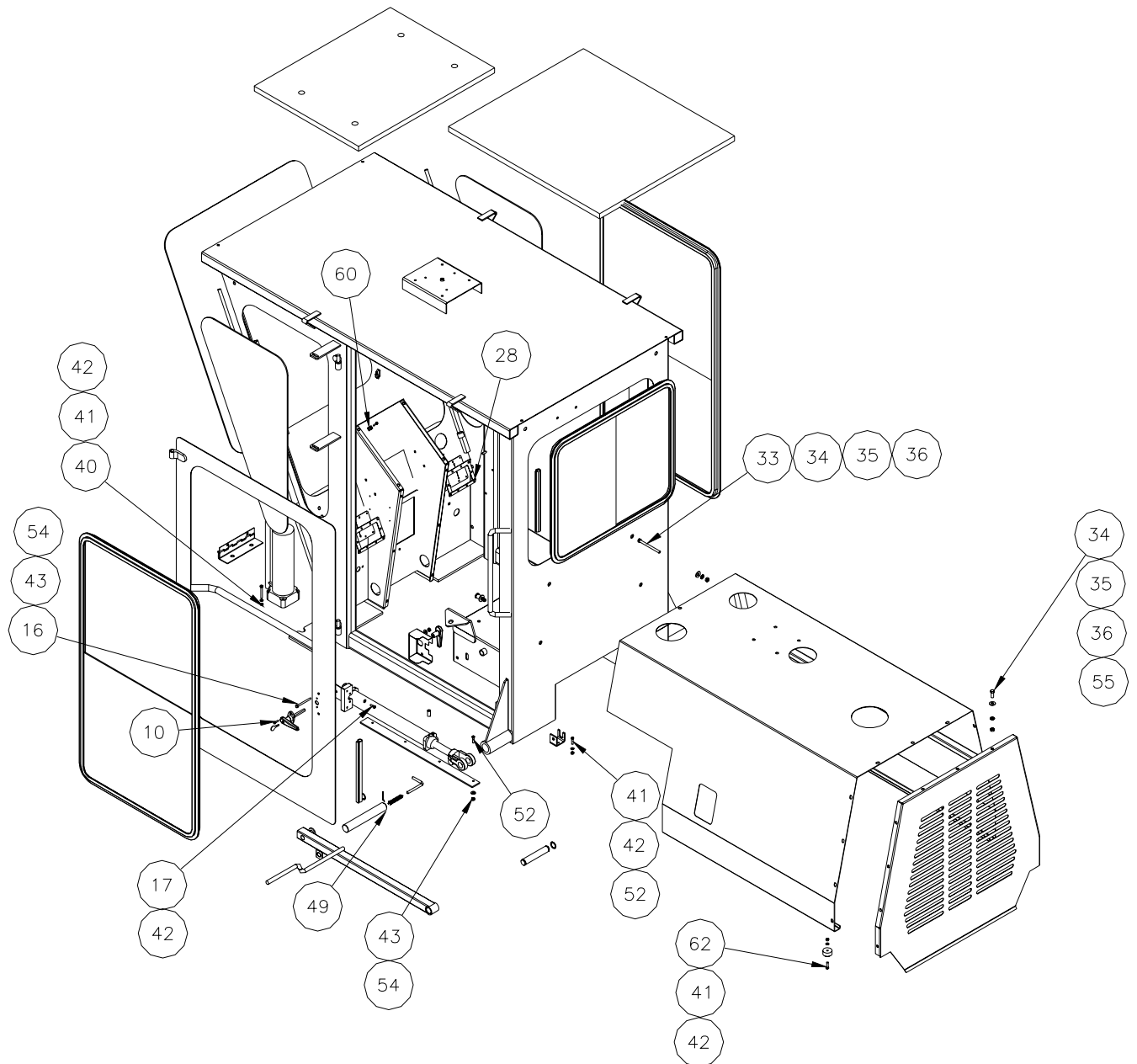




ITEM	PART NO.	QTY.	DESCRIPTION
1	27520	1.00	W/M,CAB,CHAL2
2	38311	2.00	WINDOW,SLIDING,DROP (See Detail Following)
3	38312	1.00	WINDOW,SLIDING (See Detail Following)
4	38346	30.00	WEATHERSTRIP,WINDOW
5	38470	16.00	SEAL,TRIM,PUSH-ON,RUB,.125GRIP
6	38557	1.00	HEADLINER,FRONT
7	26261	1.00	HEADLINER,REAR
10	871041003	2.00	MACH SCR,FH,#10-24X1.00
11	38252	1.00	BREATHER,BRONZE,.38 NPT
12	38350	1.00	LATCH,ROTARY
13	38351	1.00	HANDLE,LOCKING DOOR
14	38352	1.00	HANDLE,INSIDE
15	38353	1.00	BOLT,STRIKER
16	80449	2.00	CSHH,.250-20X2.75,GR5
17	80192	2.00	CSHH,.250-20X.75,GR5
18	38354	1.00	WINDSHIELD
19	38556	2.00	WINDOW,SIDE
20	26262	1.00	CAB DOOR W/M
21	38316	1.00	PUMP,HAND
22	37200	1.00	LINK,QUICK,.188 CHAIN
25	26263	2.00	COVER,GASKET
26	26265	1.00	GASKET,CONTROL LEVER
27	26266	1.00	GASKET,CONTROL LEVER
28	81160	20.00	SCR,SLFDRL,HH,#10X1.00,#3PT
29	26199	1.00	COVER,LATCH
30	5100-100	2.00	EXTERNAL RETAINING RING 1"
31	90735	.50	OIL,HYDRAULIC,MULTI SERVICE
32	27546	1.00	ENGINE COVER,W/M
33	80447	4.00	CSHH,.375-16X4.00,GR5
34	80038	17.00	NUT,HEX,.375-16
35	80142	23.00	WASHER,TYPE A PLAIN,.375
36	80162	17.00	WASHER,SPLIT LOCK,.375
37	26858	1.00	END COVER,ENGINE
39	38392	2.00	BUMPER,1.50ODX.75
40	80197	3.00	CSHH,.250-20X2.25,GR5
41	80036	10.00	NUT,HEX,.250-20
42	80160	10.00	WASHER,SPLIT LOCK,.250
43	80140	10.00	WASHER,TYPE A PLAIN,.250
44	38547	1.00	CYL,HYD,CAB LIFT,2.0X16.0
45	26253	1.00	PIN,CAB SAFETY LOCK
46	26247	1.00	SAFETY BAR,W/M
47	26647	2.00	PIN,CAB LOCK DOWN
48	26649	2.00	HANDLE,CAB LOCK DOWN
49	80332	2.00	COTTER PIN,.125X1.50
50	38245	2.00	SPRING,COMP,.66X3.00X.063



ITEM	PART NO.	QTY.	DESCRIPTION
51	26651	2.00	BRACKET,CAB LOCK DOWN,W/M
52	80185	8.00	CSHH,.250-20X1.00,GR5
53	26850	2.00	RUBBER STRIP,CAB
54	80350	10.00	NUT,FLEXLOC,.250-20,FULL,LT
55	80221	11.00	CSHH,.375-16X1.00,GR5
56	38462	1.00	ADHESIVE,AEROSOL SPRAY,CAN
57	38469	1.00	LABOR,GLASS INSTALL
58	26915	1.00	HARNESS,CAB,LEFT
59	26916	1.00	HARNESS,CAB,RIGHT
60	35692	10.00	NUT,U-TYPE,.250-20,FULL EXTRN
62	80185	2.00	CSHH,.250-20X1.00,GR5
2	38311	2.00	WINDOW, SLIDING, DROP
	38311-01	1.00	SLIDE GLASS
	38311-02	1.00	STATIONARY GLASS
	38311-03	1.00	LOCK ASSY,LH
	38311-04	1.00	LOCK ASSY,RH
	38311-05	1.00	SEAL,FLOCKED RUBBER
3	38312	1.00	WINDOW, SLIDING
	38312-01	2.00	SLIDE GLASS
	38312-02	2.00	LOCK ASSY
	38312-03	1.00	SEAL,FLOCKED RUBBER

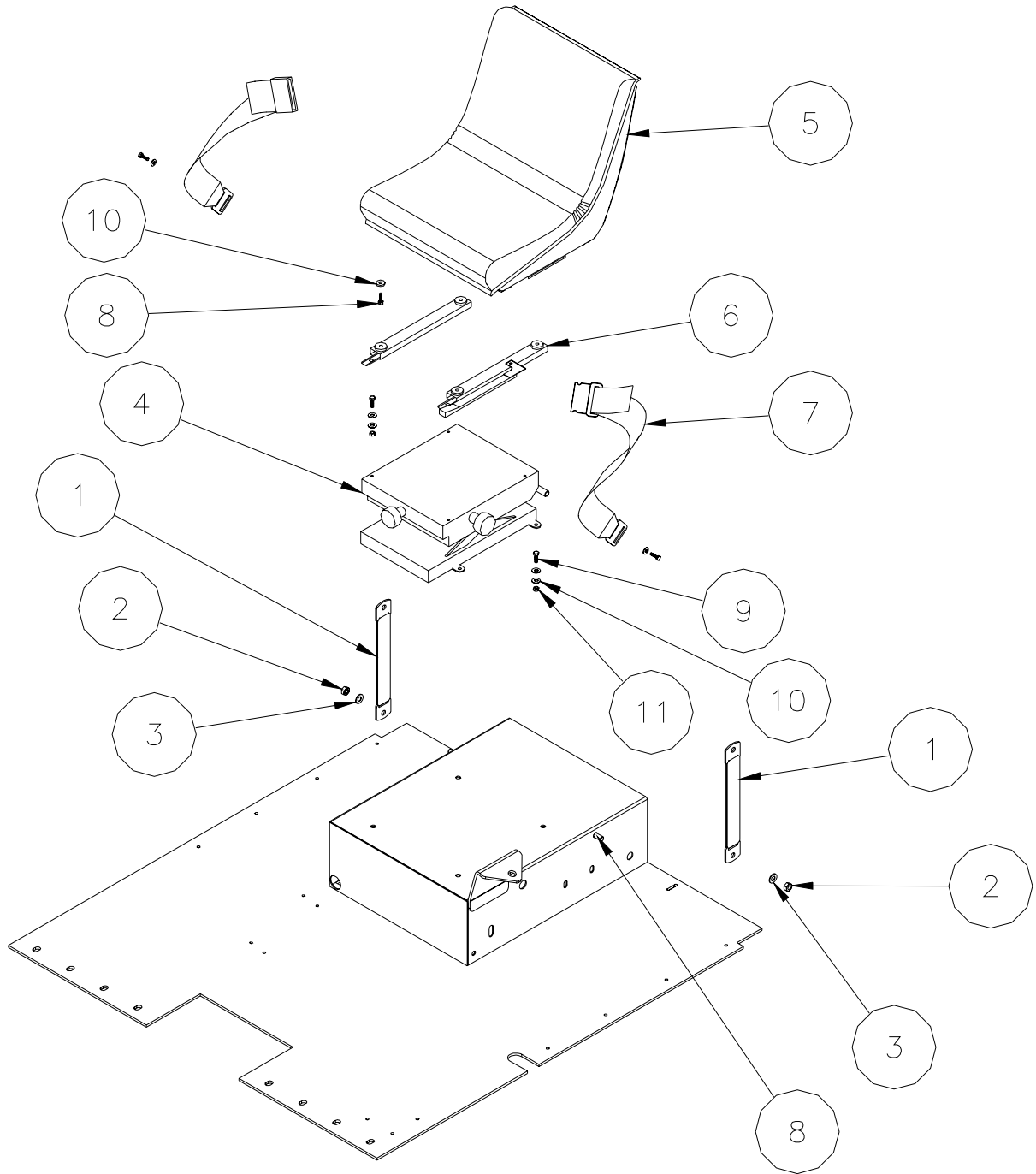


SUSPENSION SEAT ASSEMBLY**Challenger II**

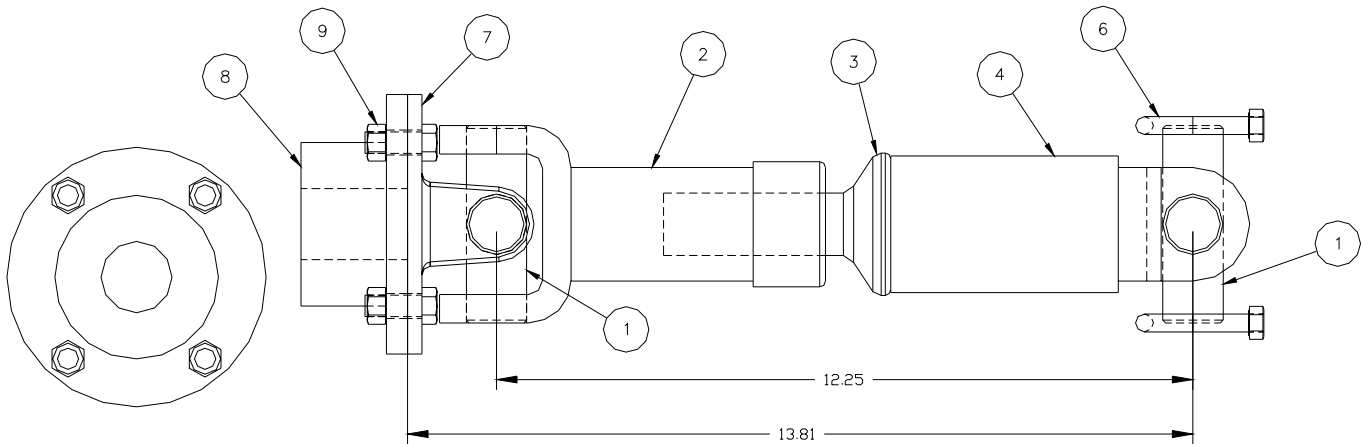
REF: 27032

REV: 0

ITEM	PART NO.	QTY.	DESCRIPTION
1	37982	1.00	TETHER KIT,12.0
2	80039	2.00	NUT,HEX,.438-14
3	80143	2.00	WASHER,TYPE A PLAIN,.438
4	72048-01	1.00	SUSPENSION,LOW PROFILE
5	72527	1.00	SEAT,MICHIGAN,SERIES V-818
6	72527-01	1.00	SLIDER SET,SEAT BASE
7	36898	1.00	SEAT BELT, 3.00 W/HARDWARE
8	80207	4.00	CSHH,.312-18X.75,GR5
9	80208	8.00	CSHH,.312-18X1.00,GR5
10	80141	20.00	WASHER,TYPE A PLAIN,.312
11	80351	8.00	NUT,FLEXLOC,.312-18,FULL,LT



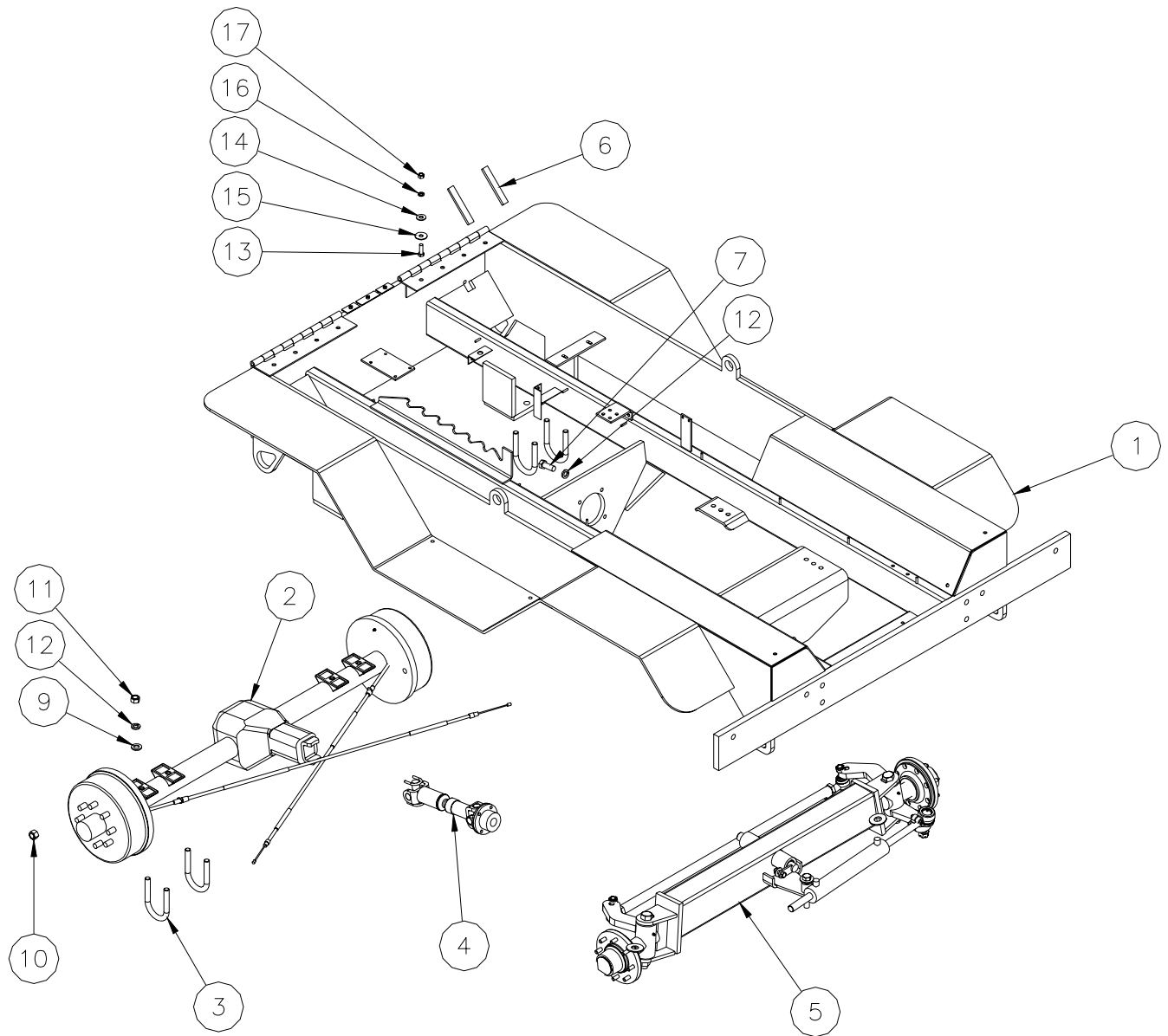
ITEM	PART NO.	QTY.	DESCRIPTION
1	27268	1.00	FRAME,CHAL2,W/M
2	26259	1.00	DRIVE AXLE ASSY
3	38341	4.00	U-BOLT,DRIVE AXLE
4	38518	1.00	DRIVE SHAFT ASSY,CHAL2 (See Detail Below)
5	27060	1.00	STEERING AXLE ASSY,CHAL2
6	38489	10.00	FOAM,WEATHERSTRIP,.38X1.00X25'
7	80460	4.00	CSHH,.750-16X2.00,GR5
8	91464	8.00	OIL,GEAR LUBE,LS
9	80698	8.00	WASHER,SAE PLAIN,.750
10	33517-04	16.00	WHEEL NUT
11	80061	8.00	NUT,HEX,.750-16
12	80168	12.00	WASHER,SPLIT LOCK,.750
13	81113	8.00	CSHH,.500-13X1.50,GR8
14	80144	8.00	WASHER,TYPE A PLAIN,.500
15	81141	8.00	WASHER,SAE,HARDENED,.500
16	80164	8.00	WASHER,SPLIT LOCK,.500
17	80040	8.00	NUT,HEX,.500-13



ITEM	QTY	PART NO.	DISC
1	2	38518-01	UNIVERSAL JOINT
2	1	38518-02	SLIP YOKE
3	1	38518-03	STUB SHAFT
4	1	38518-04	TUBE YOKE
5	1	38518-05	TUBING
6	1	38518-06	U-BOLT KIT
7	1	38518-07	FLANGE YOKE
8	1	38518-08	1.26 X 14 SPLINE
9	1	38518-09	HARDWARE KIT
10	2	38518-10	.375-16 X 1.00

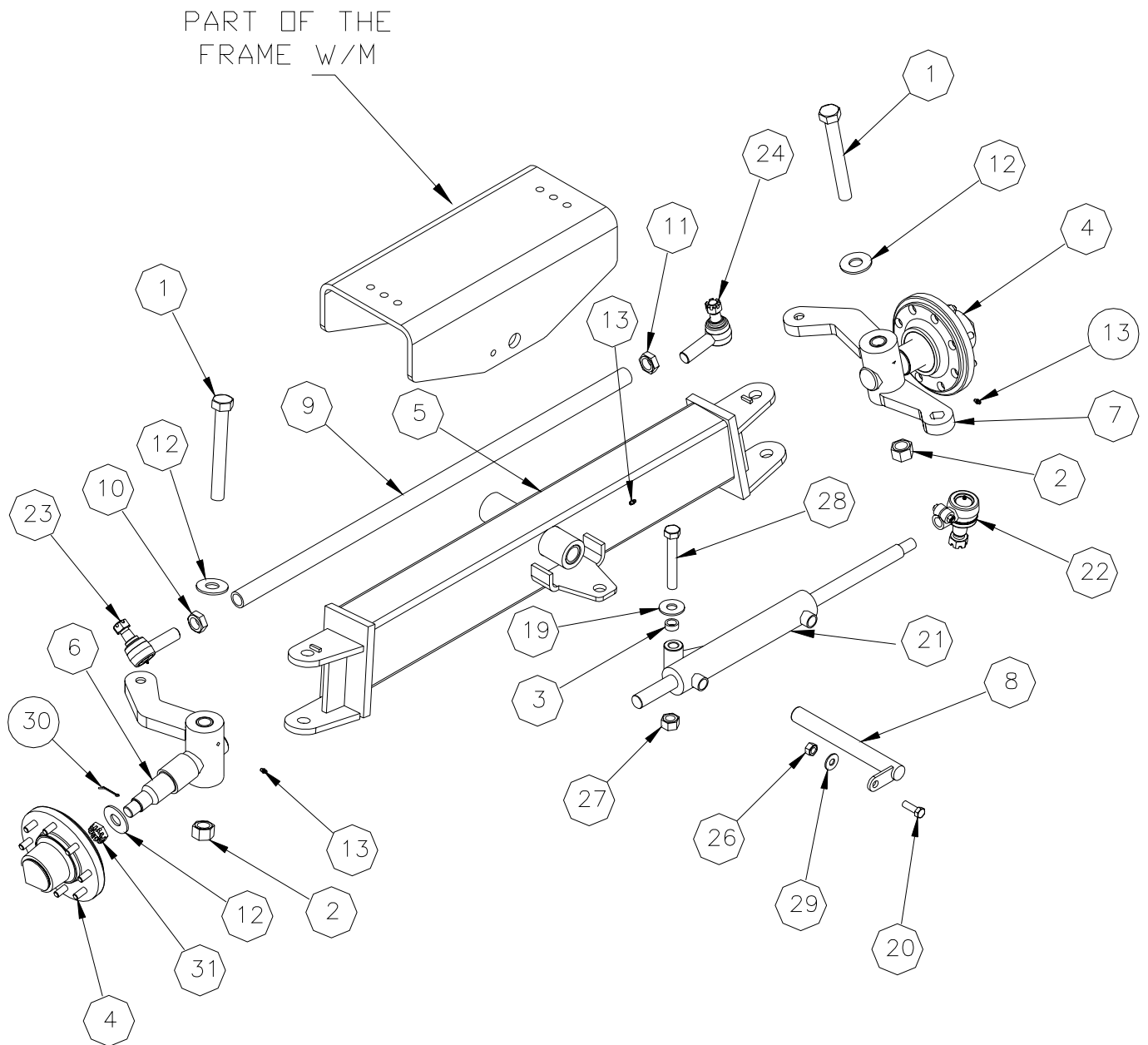
CONTINENTAL ENGR. & MFG., INC
P.O. BOX 68
CHASKA, MN 55318
PH 952-448-4771
FAX 952-448-5595

1350 SERIES DRIVESHAFT
PART # SA35122-1381



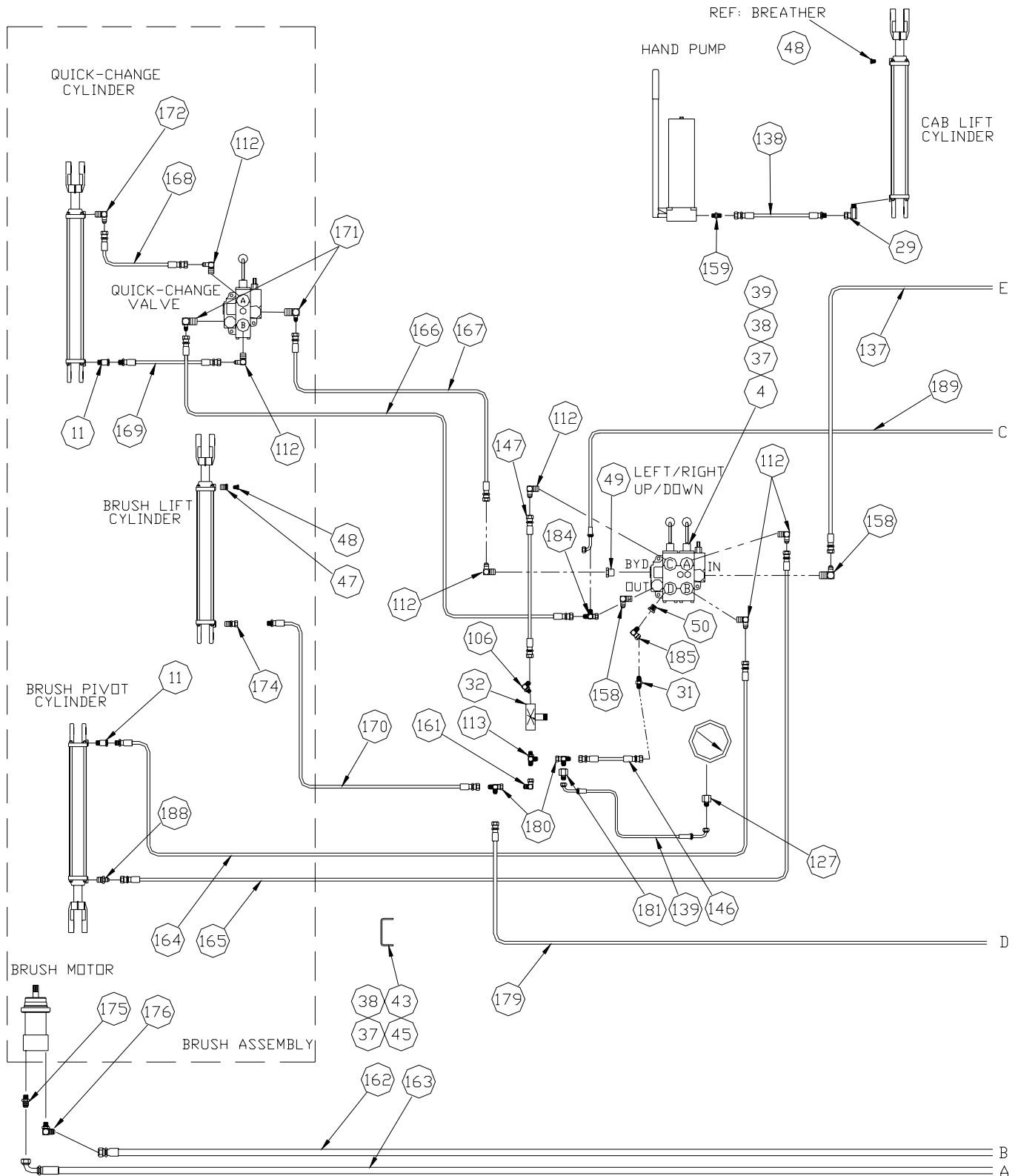
NOTE: FILL DRIVE AXLE ASSY (ITEM 2) WITH GEAR LUBE OIL (ITEM 18)
TO 1.0 INCH BELOW FILL PLUG

ITEM	PART NO.	QTY.	DESCRIPTION
1	81184	2.00	CSHH,1.000-8X8.0,GR5
2	80359	2.00	NUT,FLEXLOC,1.000-8,FULL,LT
3	16935	1.00	SLEEVE,STEERING CYL. MOUNT
4	38303	2.00	HUB KIT
5	27051	1.00	STEERING AXLE,W/M CHAL2
6	27056	1.00	W/M,SPINDLE,RH
7	27059	1.00	SPINDLE W/M,LH
8	20724	1.00	SHAFT W/M,PIVOT,FRONT AXLE
9	27053	1.00	TIE ROD TUBE
10	21113	1.00	NUT,JAM,1.00-16,RH
11	21114	1.00	NUT,JAM,1.00-16,LH
12	80149	4.00	WASHER,TYPE A PLAIN,1.000
13	33684	3.00	FITT,LUBE,STR,02MP,SHORT
19	80147	1.00	WASHER,TYPE A PLAIN,.750
20	71627	1.00	CSHH,.500-13X1.50,GR5
21	36754	1.00	CYL,HYD,2.00X10.75,STEERING
	33805-01		SEAL KIT,STEERING CYL
22	36755	1.00	STEERING CYLINDER END
23	36756	1.00	TIE ROD END,RH
24	36757	1.00	TIE ROD END,LH
26	80354	1.00	NUT,FLEXLOC,.500-13,FULL,LT
27	80357	1.00	NUT,FLEXLOC,.750-10,FULL,LT
28	80839	1.00	CSHH,.750-10X5.00,GR5
29	80144	1.00	WASHER,TYPE A PLAIN,.500
30	80332	2.00	COTTER PIN,.125X1.50
31	31713	2.00	NUT,6BF SPINDLE



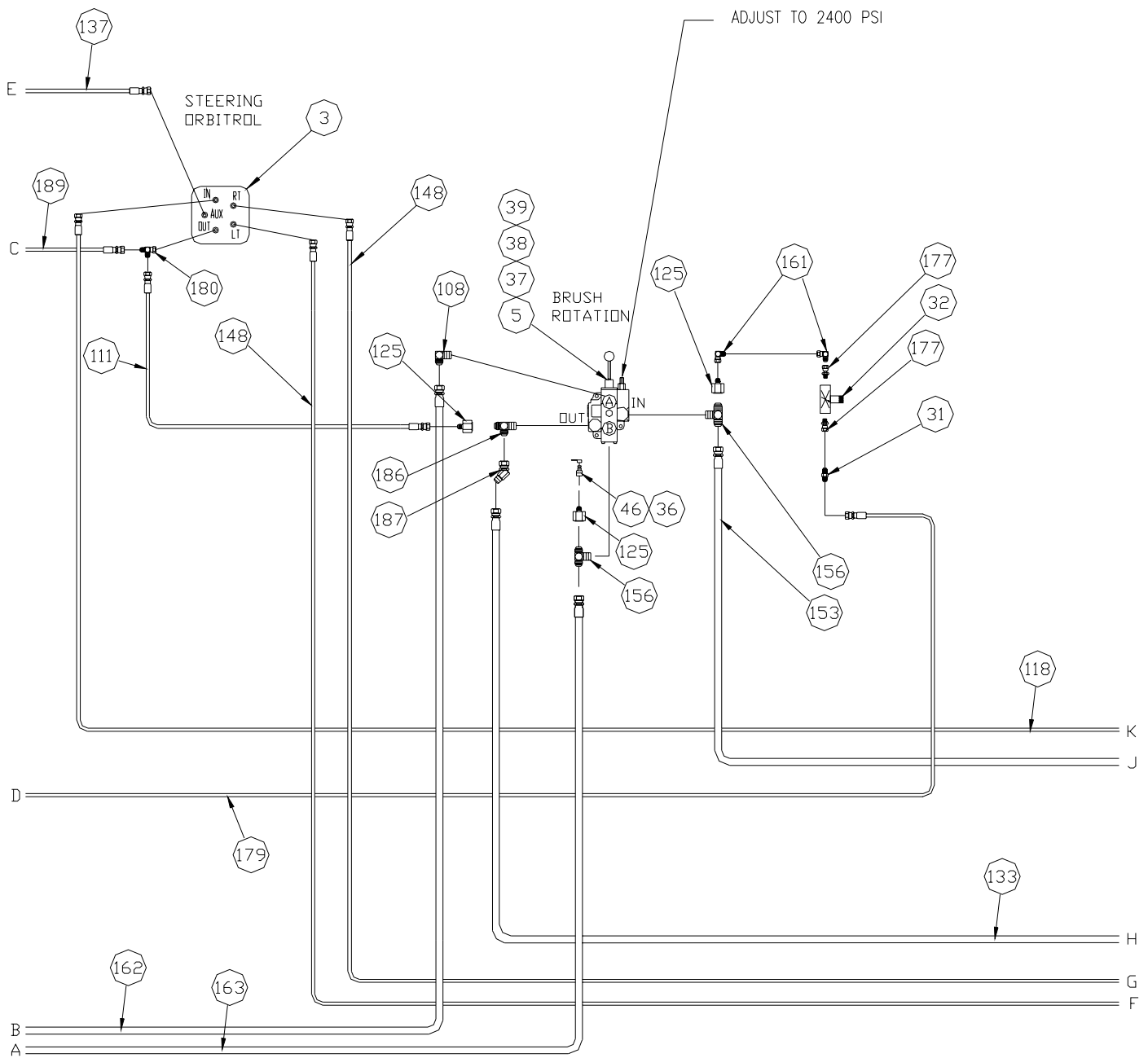
ITEM	PART NO.	QTY.	DESCRIPTION
	27466	REV. B	HYDRAULIC ASSEMBLY
1	38305	1.00	VLV,FLOW DIVIDER
3	38627	1.00	ORBITROL,STEERING,4.95 CIR
4	38318	1.00	VLV,HYD,BRUSH PIVOT/LIFT
5	38319	1.00	VLV,HYD,BRUSH
6	38514	1.00	MOTOR,HYD,100CC
7	26675	1.00	HYD PUMP,REWORK
8	34463	1.00	FILTER,RETURN,HP,-12SAE PORTS
9	38323	1.00	PUMP,HYD,GEAR,2.3 CU IN/REV,CW
10	38755-01	1.00	FILTER,HYD,ELEMENT,10 MICRON
11	26943	2.00	FITT,STR 06MP-06FPX,ORF,.063
12	38755	1.00	FILTER,HYD,TANK RETURN
13	37680	1.00	FILLER,HYD FLUID,10 PSI
15	38628	1.00	KIT,HOSE & ADAPTER,CHAL2 (See Detail)
16	27390	1.00	HYDRAULIC TANK,W/M
17	37137	1.00	GAUGE,SIGHT LEVEL/TEMP,5.00
19	80192	12.00	CSHH,.250-20X.75,GR5
20	80140	6.00	WASHER,TYPE A PLAIN,.250
15	38628	REV. A	KIT, HOSE & ADAPTER, CHAL2
101	X321	2.00	FITT,45 16MJ-16MB
103	33493	1.00	FITT,90 20MJ-20MB
104	33887	1.00	FITT,STR 16MJ-16MB
105	33890	1.00	FITT,90 20MJ-20MP
106	33892	1.00	FITT,90 06MJ-06MB
108	34072	2.00	FITT,90 12MJ-12MP
110	34111	1.00	FITT,TEE 16MJ-16FJX-16MJ
111	72549-029	1.00	HOSE,06,06FJX-06RJ90,3000
112	34536	7.00	FITT,90 06MJ-08MP
113	35494	1.00	FITT,TEE 06MJ-06MB-06MJ
114	35781	1.00	FITT,90 16MJ-20MP
116	36638	1.00	FITT,STR 16MJ-12MP
117	X319	1.00	FITT,90 16MJ-16MB
118	72599-064	1.00	HOSE,06,06FJX-08FJX,3000
121	36710	2.00	FITT,90-L 16MJ-16FL,CODE 62
122	33104	4.00	FITT,KIT 16FL,CODE 62
125	X326	3.00	FITT,STR 06MJ-12FJ
126	38446	1.00	FITT,90 16MB-16FJX
127	38447	1.00	FITT,STR 04FP-04MJ
38546	QUICK CHANGE CYLINDER		ITEM #20, PAGE 50
38549	BRUSH LIFT CYLINDER		ITEM #13, PAGE 54
38548	BRUSH PIVOT CYLINDER		ITEM #27, PAGE 50
38286	BRUSH MOTOR		ITEM #13, PAGE 50
38316	HAND PUMP		ITEM #21, PAGE 8
38547	CAB LIFT CYLINDER		ITEM #44, PAGE 8

ITEMS 101 TO 189 ARE PART OF ITEM 15, HOSE KIT



ITEM	PART NO.	QTY.	DESCRIPTION
	27466	REV. B	HYDRAULIC ASSEMBLY (Continued)
21	80160	12.00	WASHER,SPLIT LOCK,.250
22	35423	1.00	COOLER,OIL
23	28008	1.00	LID,HYD TANK
24	80787	2.00	CSHH,.250-20X2.50,GR5
25	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
26	80206	2.00	CSHH,.312-18X1.25,GR5
27	80161	2.00	WASHER,SPLIT LOCK,.312
28	33148	2.00	STRAINER,SUCT,2NPT,25GPM,100ME
29	26867	1.00	FITT,90 06MP-06FPX,ORF.063
30	91500	30.00	OIL,HYDRAULIC,ISO68
31	38641	2.00	VLV,CHECK,06MJ,20 PSI CRACK
32	35552	2.00	VLV,NEEDLE,HYDRAULIC
15	38628	REV. A	KIT, HOSE & ADAPTER, CHAL2 (Continued)
128	38522-48	1.00	HOSE,16,16RJ90-16FH90B,6000,OS
129	38523-52	1.00	HOSE,16,16FJX-16FH90B,6000
130	38451-038	1.00	HOSE,20,20FJX-20FJX,200
131	38676-049	1.00	HOSE,16,16FJX-16FJX,300
132	38452-82	1.00	HOSE,16,16FJX-16FJX,250
133	38675-121	1.00	HOSE,16,16FJX-12FJX,1000
134	38537-33	1.00	HOSE,12,12RJ90-12RJ90,180 OS
135	38455-19	1.00	HOSE,08,12FJX-08RJ90,3000
136	38456-14	1.00	HOSE,08,08FJX-08RJ90,3000
137	72597-021	1.00	HOSE,08,06FJX-08FJX,3000
138	38458-35	1.00	HOSE,06,06FJX-06MP,3000
139	38459-28.5	1.00	HOSE,04,04RJ90-04RJ90,5000
141	71775	3.00	FITT,90 12MJ-12MB
146	72550-20	1.00	HOSE,06,06FJX-06FJX,3000
147	72550-35	1.00	HOSE,06,06FJX-06FJX,3000
148	72550-135	2.00	HOSE,06,06FJX-06FJX,3000
149	72560-28	1.00	HOSE,12,12FJX-12FJX,1250
153	72595-59	1.00	HOSE,12,12FJX-12FJX,3000
154	853180160	1.00	FITT,STR 12MJ-12MB
155	853180167	2.00	FITT,STR 08MJ-10MB
156	853180633	2.00	FITT,TEE 12MJ-12MJ-12MP
157	X170	1.00	FITT,STR 08MJ-12MB
158	X180	3.00	FITT,90 08MJ-12MP
159	X217	1.00	FITT,STR 06MJ-06MB
160	X364	1.00	FITT,STR 12MJ-16FJ
161	X387	3.00	FITT,90 06MJ-06FJX
162	72565-121	1.00	HOSE,12,12FJX-12FJX,2250
163	72564-115	1.00	HOSE,12,12FJX-12RJ90,2250
164	38458-73	1.00	HOSE,06,06FJX-06MP,3000

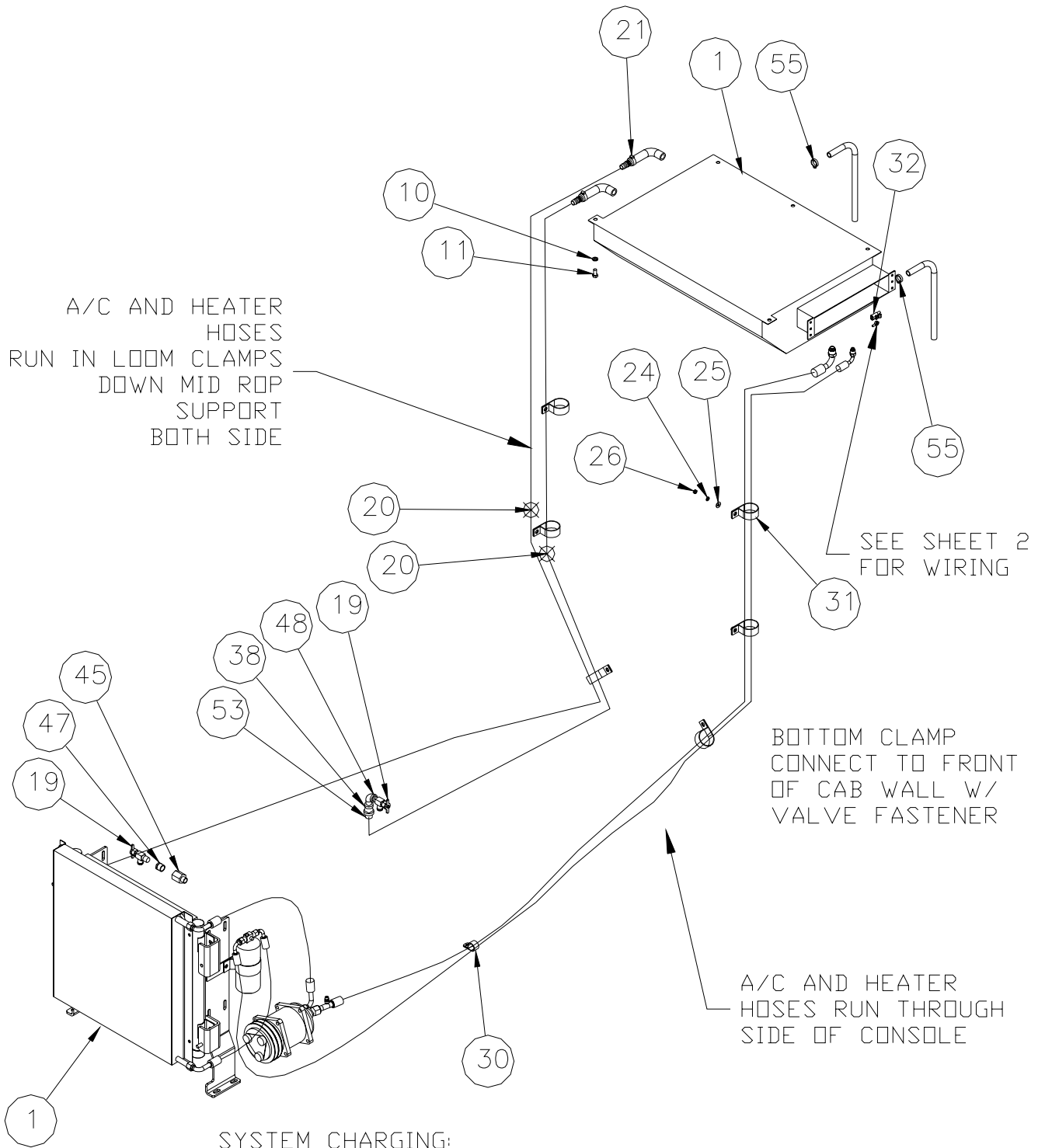
ITEMS 101 TO 189 ARE PART OF ITEM 15, HOSE KIT



ITEM	PART NO.	QTY.	DESCRIPTION
	27466	REV. B	HYDRAULIC ASSEMBLY (Continued)
33	17670	1.00	CLAMP,NEEDLE VALVE
34	80036	2.00	NUT,HEX,.250-20
35	72689	3.00	FITT,TEST 06MB-02PD
36	72372	4.00	FITT,PLUG 02PD,DUST
37	80038	7.00	NUT,HEX,.375-16
38	80162	7.00	WASHER,SPLIT LOCK,.375
39	80230	5.00	CSHH,.375-16X2.00,GR5
40	99539	1.00	PIPE,PLUG,16MP,SQ HD,MI
43	38482	1.00	U-BOLT,.375-16,4.00IW,3.00IL
45	37002	8.00	SLEEVE,ABRASION,NYLON,3.20ID
46	72844	1.00	FITT,TEST 06FJ-02PD
47	99450	1.00	PIPE,BUSH,08MP-06FP,MI
48	38252	1.00	BREATHER,BRONZE,.38 NPT
49	99985	1.00	PIPE,BUSH,12MP-08FP,STL
50	33356	1.00	PIPE,BUSH,08MP-06FP,STL
51	99535	1.00	PIPE,PLUG,04MP,SQ HD,MI
15	38628	REV. A	KIT, HOSE & ADAPTER, CHAL2 (Continued)
165	72550-83	1.00	HOSE,06,06FJX-06FJX,3000
166	72599-086	1.00	HOSE,06,06FJX-08FJX,3000
167	72550-093	1.00	HOSE,06,06FJX-06FJX,3000
168	72550-021	1.00	HOSE,06,06FJX-06FJX,3000
169	38458-18	1.00	HOSE,06,06FJX-06MP,3000
170	38458-45	1.00	HOSE,06,06FJX-06MP,3000
171	38490	2.00	FITT,90 06MJ-12MP
172	X383	1.00	FITT,90 06MJ-06MP
174	5918	1.00	FITT,STR 08MP-06FPX
175	71882	1.00	FITT,STR 12MJ-10MB
176	38491	1.00	FITT,90 12MJ-10MB,USE 34083
177	37536	2.00	FITT,STR 06MB-06FJX
179	37634-14	1.00	HOSE,06,06FJX-06FJX,2250
180	36490	3.00	FITT,TEE 06MJ-06FJX-06MJ
181	37394	1.00	FITT,STR 04MJ-06FJ
182	X365	1.00	FITT,90 12MJ-12FJX
183	34535	2.00	FITT,90 06MJ-08MB
184	33898	1.00	FITT,TEE 08MJ-08FJX-08MJ
185	38673	1.00	FITT,90 06MP-06FJX
186	72314	1.00	FITT,TEE 12MJ-12MP-12MJ
187	71776	1.00	FITT,45 12MJ-12FJX
188	35499	1.00	FITT,STR 06MJ-06MP
189	72598-020	1.00	HOSE,06,06FJX-08RJ90,3000
36754	STEERING CYLINDER		ITEM #21, PAGE 16

ITEM	PART NO.	QTY.	DESCRIPTION
1	26213	1.00	FUEL TANK W/M
2	36105	1.00	CAP,FUEL,W/LOCK LUG
3	38373	1.00	SENDING UNIT,FUEL TANK
4	38217	1.00	FILTER,INLINE FUEL,.31 HOSE
5	71812	5.00	HOSE,05,PUSH-ON,.3125
6	33162	9.00	CLAMP,HOSE,.44-.78,WORM,#06
8	27422	1.00	COVER,FUEL TANK,W/M
9	80192	8.00	CSHH,.250-20X.75,GR5
10	80160	8.00	WASHER,SPLIT LOCK,.250
11	5347	3.00	HOSE,04,PUSH-ON,LOW PRESS
12	35045	1.00	FITT,45 04MP-04HB,CRIMPED
13	38425	1.00	FITT,STR 05FJX-05HB
14	81202	5.00	MACH SCR,PH,#10-32X1.25
15	871071601	5.00	WASHER,SPLIT LOCK,#10
16	99539	1.00	PIPE,PLUG,16MP,SQ HD,MI
17	36886	1.00	VLV,CHECK 06HB,POLY (1PSI)
18	72369	1.00	VLV,45 04MP-05HB,CRIMPED

ITEM	PART NO.	QTY.	DESCRIPTION
1	38525	1.00	AIR CONDITIONING / HEATER KIT,PERRIN <i>(See Schematics, End of Section)</i>
2	27017	1.00	BRACKET,A/C DRYER
3	26489	1.00	MOUNT,AC W/M
4	26778	2.00	BRACKET,A/C COMPRESSOR
5	81015	1.00	CSHH,.438-14X5.00,GR5
7	27014	1.00	PLATE,MOUNT,A/C CONDENSOR
8	80221	12.00	CSHH,.375-16X1.00,GR5
9	80226	2.00	CSHH,.375-16X1.50,GR5
10	80162	17.00	WASHER,SPLIT LOCK,.375
11	80219	5.00	CSHH,.375-16X.75,GR5
12	80038	6.00	NUT,HEX,.375-16
13	6352	10.00	HOSE,08,PUSH-ON,250
14	80207	4.00	CSHH,.312-18X.75,GR5
15	80161	2.00	WASHER,SPLIT LOCK,.312
18	80142	16.00	WASHER,TYPE A PLAIN,.375
19	35546	2.00	VLV,HEATER SHUTOFF
20	36712	30.00	HOSE,HEATER,.625 ID
21	33164	8.00	CLAMP,HOSE,.56-1.06,WORM,#10
23	80185	2.00	CSHH,.250-20X1.00,GR5
24	80160	8.00	WASHER,SPLIT LOCK,.250
25	80140	7.00	WASHER,TYPE A PLAIN,.250
26	80036	8.00	NUT,HEX,.250-20
27	80039	1.00	NUT,HEX,.438-14
28	80143	1.00	WASHER,TYPE A PLAIN,.438
29	80163	1.00	WASHER,SPLIT LOCK,.438
30	33595	1.00	CLAMP,LOOP,1.00 OD,REM CUSHION
31	34799	6.00	CLAMP,LOOP,1.562 OD,NPRN COVER
32	35139	1.00	CONNECTOR,SEALED,TOWER,2-PIN
33	36165	1.00	TERM,SEALED CONN,16-14 GA,FEM
34	36166	2.00	SEAL,CABLE,18-16 GA
35	36623	1.00	SEAL,CABLE,14 GA
36	36342	1.00	FUSE,BLADE,20AMP,ATC-20
38	99552	1.00	PIPE,RED,08FP-06FP,MI
40	33597	10.00	TIE WRAP,.188X11.00
41	38670	1.00	V BELT,L4 44.000X.50
45	38468	1.00	FITT,STR M18X1.5M-08MP
46	27015	1.00	HINGE,A/C CONDENSOR
47	99450	1.00	PIPE,BUSH,08MP-06FP,MI
48	99525	1.00	PIPE,90,06MP-06FP,MI
51	80224	2.00	CSHH,.375-16X1.25,GR5
52	80141	2.00	WASHER,TYPE A PLAIN,.312
53	99596	1.00	PIPE,NIPPLE,08XCLOSE
54	33607	1.00	TERM,RING,16-14 GA,.250 STUD
55	33163	2.00	CLAMP,HOSE,.50-.91,WORM,#08
56	27237	1.00	SASH CHAIN,23 LINKS
57	33220	2.00	RIVET,BLIND,STL,.125,.188-.250



A/C AND HEATER
 HOSES
 RUN IN LOOM CLAMPS
 DOWN MID ROP
 SUPPORT
 BOTH SIDE

SEE SHEET 2
 FOR WIRING

BOTTOM CLAMP
 CONNECT TO FRONT
 OF CAB WALL W/
 VALVE FASTENER

A/C AND HEATER
 HOSES RUN THROUGH
 SIDE OF CONSOLE

- SYSTEM CHARGING:
- 1) ADD 1.0 OZ COMPRESSOR OIL.
 - 2) ADD 2.75-3.25 LBS R-134A FREON.
 - 3) HI-SIDE PRESSURE = 213-242 PSI.

SEE SUPPORTING TEXT ON PREVIOUS PAGE.

50	1	Wire Clip	1847	38525-46	
49	1	Coil Mounting Plate	8104	38525-45	
48	1	Wire Assy'	8136	38525-44	
47	1	Wire Assy'	8166	38525-43	
46	1	Wire Assy'	8025	38525-42	
45	1	Wire Assy'	8024	38525-41	
44	1	Wire Assy'	8023	38525-40	
43	1	Seal	2608	38525-39	
42	1	Large Panel Nut	2607	-	
41	1	O-ring	838	36745-12	
40	1	Wire Assy'	8129	38525-38	
39	1	Grommet	1801	38525-37	
38	2	Recirc Knob	1741	36745-20	
37	2	1/4" truss Hd. 1/4-20	2083	-	
36	4	10-24 Screw	2021	-	
35	1	Fitting Adapter	11134	38525-36	
34	1	Grommet	1871	38525-35	
33	2	Grommet	1803	38525-34	
32	2	Flat Louver	1415	73070-05	
31	12	flat head screw.	2567	-	
30	1	90° watervlve.	1011	38525-33	
29	6	Worm Gear Clamp	1110	-	
28	1	Control Plate	8100	38525-32	
27	1	Recirc Housing	8101	38525-31	
26	1	Drain Foam	8127	38525-30	
25	1	Drain Foam	8126	38525-29	
24	1	Cut heater hose 3'	8140	38525-28	
23	2	Hose adapter	1148	38525-27	
22	1	Formed Heater Hose	8142	38525-26	
21	1	Formed Heater Hose	8141	38525-25	
20	1	Recirc Filter	8128	38525-24	
19	1	Recirc Door	8102	38525-23	
18	11	1/4" nut.	1942	-	
17	27	1/4" LK Washer	1938	-	
16	27	1/4" washer	1933	-	
15	16	1/4" bolt.	1904	-	
14	3	Control Knobs.	1785	36745-21	
13	3	Panel Nut.	1954	38525-22	
12	1	Coil Bkt. Lt.	8106	38525-21	
11	1	Coil Bkt. Rt.	8105	38525-20	
10	1	Fan Switch	1503	36745-18	
9	1	Cold Control	1646	36745-19	
8	1	Cable Control Assy'	8116	38525-19	
7	1	Blower Plate	8099	38525-18	
6	1	Blower Assy'	1399	38525-17	
5	4	Louvers	1385	36745-16	
4	1	Decal	11707	-	
3	1	Evap Coil Assy'	8115	38525-15	
2	1	Heater coil W/A	1054	38525-14	
1	1	Main Housing W/A	8083	38525-13	
KEY	QTY.	DESCRIPTION	PARTS NO.	SHEET SIZE	ROSCO PART NO.

3217 A/C-HEATER GROUP
PARTS NOT SHOWN

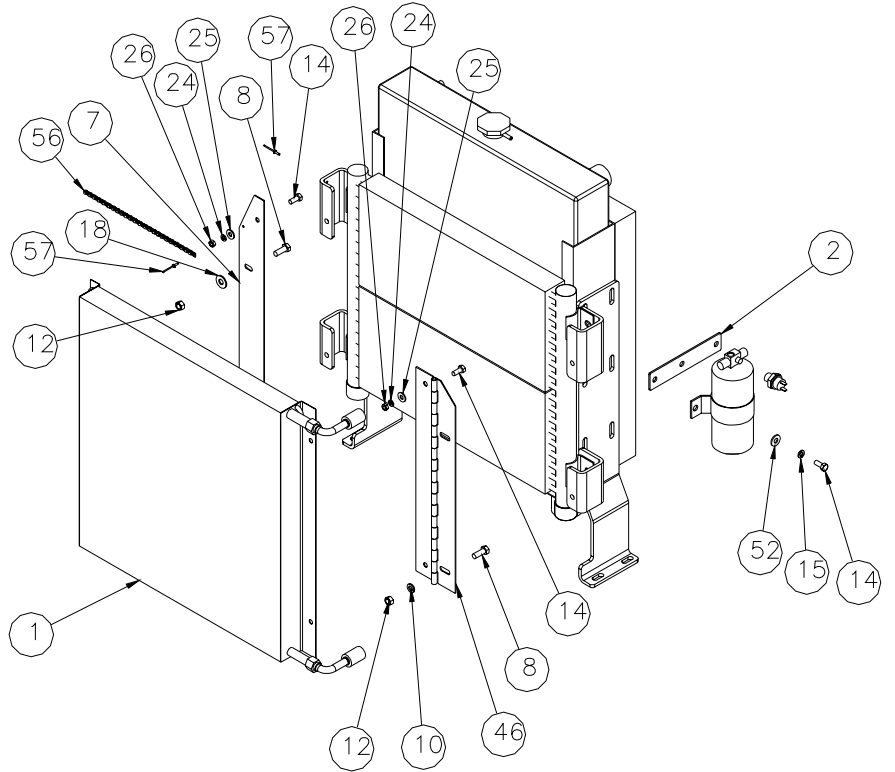
16	1	LOUVER DOOR	8103	38525-12
15	1	FILTER HOUSING ASSY	8147	-
14	1	PARTS BAG	12847	-
13	1	CUT HEATER HOSE	8118	38525-10
12	1	CUT HEATER HOSE	8117	38525-09
11	1	HOSE ASSY	8124	38525-08
10	1	HOSE ASSY	8123	38525-07
9	1	HOSE ASSY	8122	38525-06
8	1	HOSE ASSY	8121	38525-05
7	1	FDAM SHEET	8144	-
6	1	FILTER	1436	38525-04
5	1	RECIEVER DRYER	928	38525-01
4	1	CONDENSER COIL	971	38525-03
3	1	COMPRESSOR	974	38525-02
2	1	MAIN HOUSING ASSY	8125	38525
1	1	BOX	476	-
KEY	QTY.	DESCRIPTION	PARTS NO.	ROSCO PART NO.

8147 FILTER HOUSING GROUP
PARTS NOT SHOWN

2	1	TRIM BULB SEAL	8119	38525-16
1	1	FILTER HOUSING W/A	8094	38525-11
KEY	QTY.	DESCRIPTION	PARTS NO.	ROSCO PART NO.

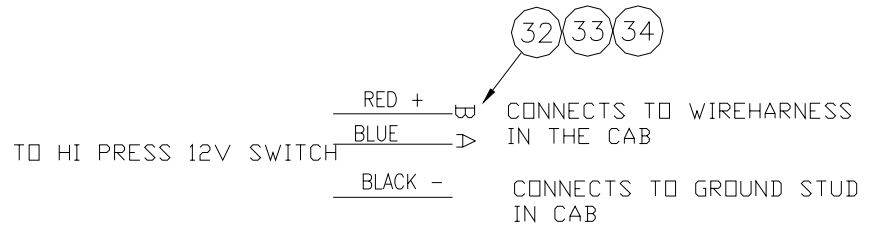
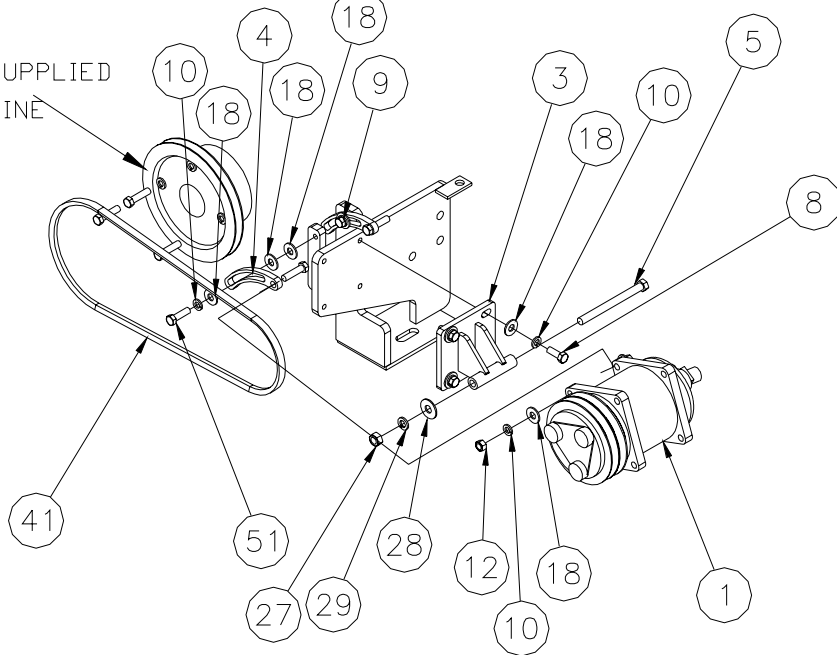
12847 PARTS BAG GROUP
PARTS NOT SHOWN

18	2	1/4-20X1/2 THUMBSCREW	2578	-
17	1	1/4-20 WHIZLOCK NUT	2086	-
16	1	RECIEVER DRYER CLAMP	6471	-
15	1	1/4" bolt.	1909	-
14	4	1/4-20 BOLT	1110	-
13	1	BAGGIE	496	-
12	2	O-RING #10	836	36745-10
11	2	O-RING #8	837	36745-11
10	4	O-RING #6	838	36745-12
9	2	CLAMPS	1139	-
8	5	1/4 WSHR	1933	-
7	5	1/4 LK WSHR	1938	-
6	4	1/4-20 BOLT	1906	-
5	1	BINARY SWITCH	11537	36745-47
4	2	UNSLIT LOOM	8120	-
3	1	WIRE ASSY	8135	-
2	1	WIRE ASSY	8134	-
1	1	PARTS BAG	453	-
KEY	QTY.	DESCRIPTION	PARTS NO.	ROSCO PART NO.

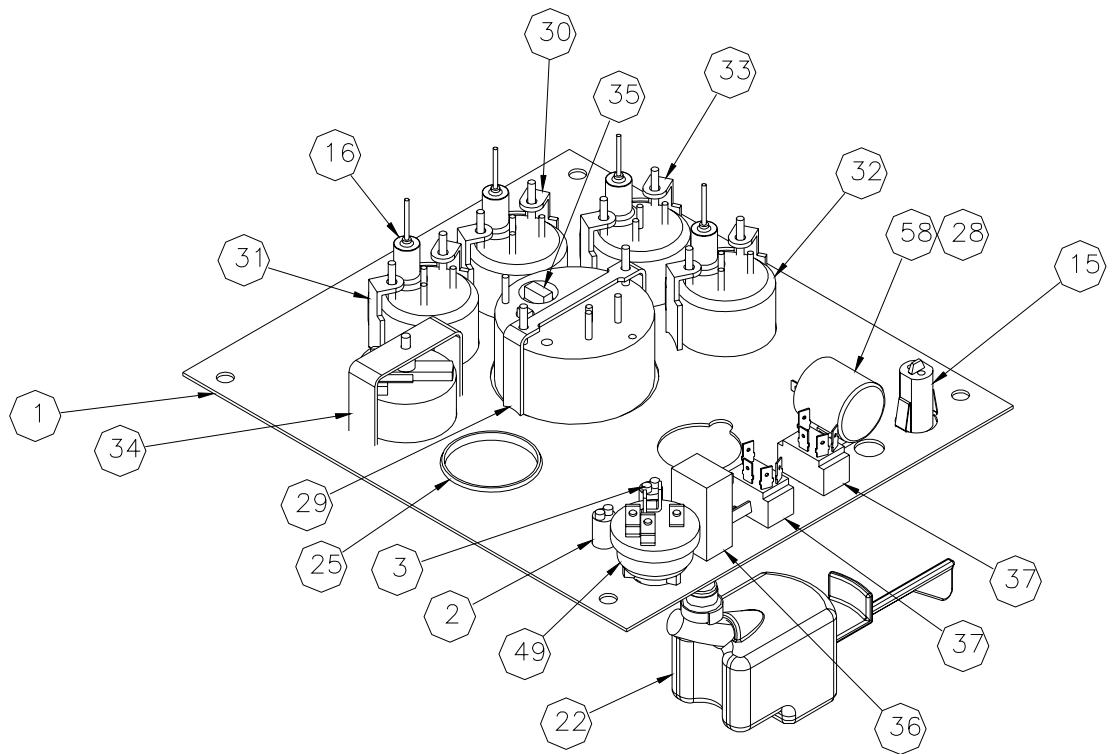
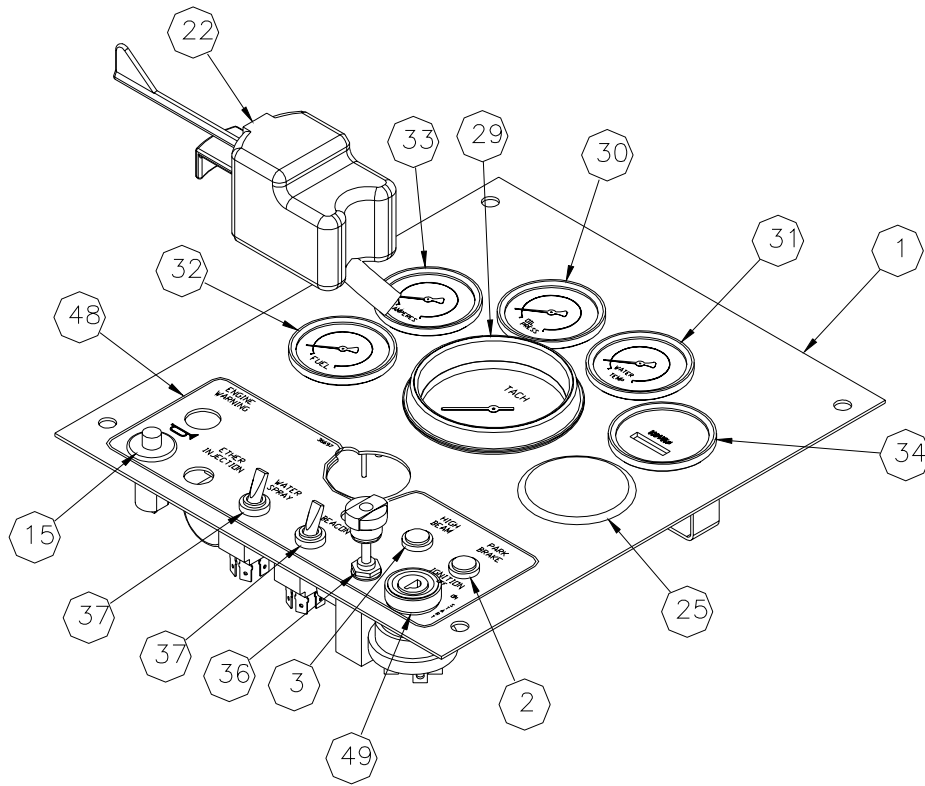


— USE ITEM 18 AS A SPACER AS NEEDED

PULLEY SUPPLIED WITH ENGINE

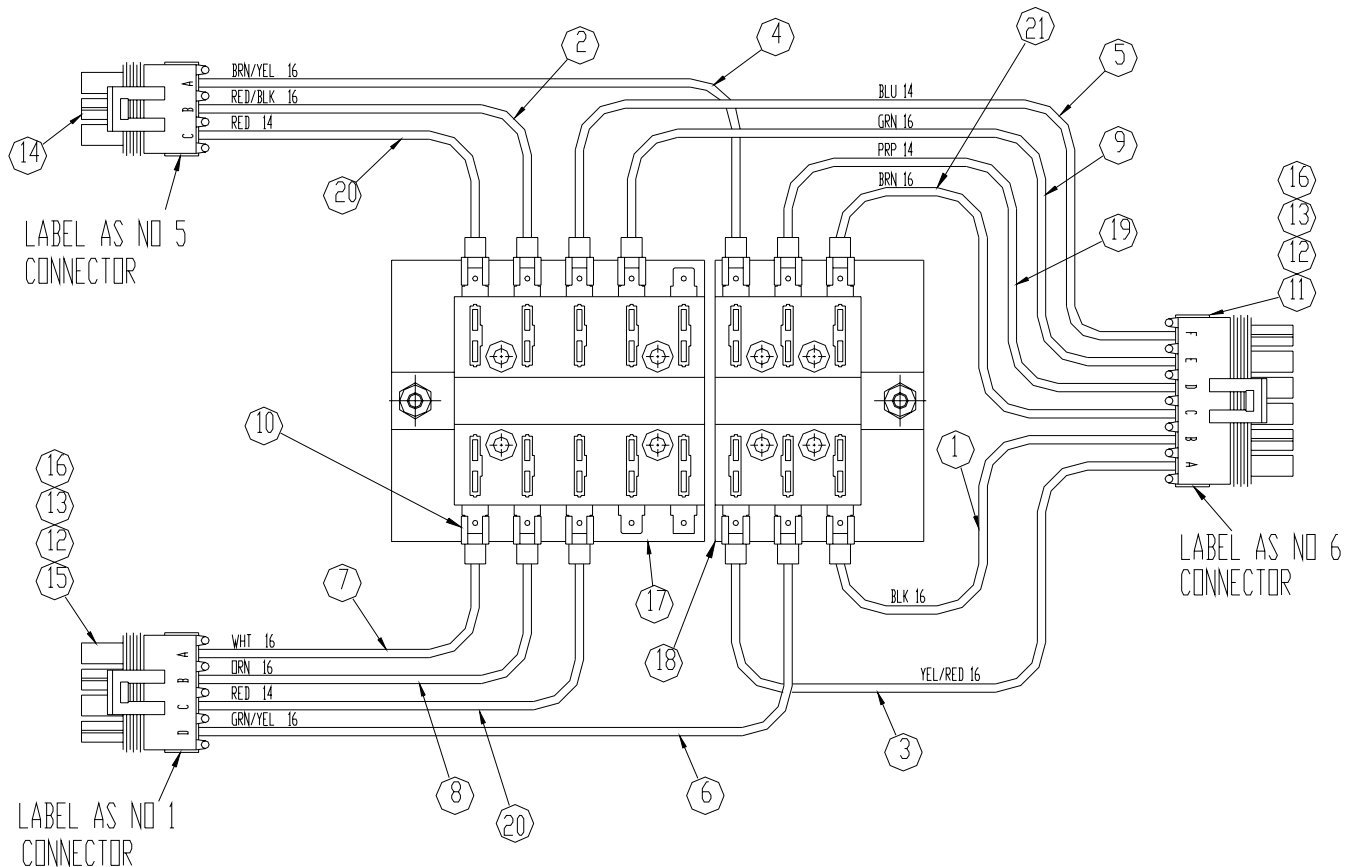


ITEM	PART NO.	QTY.	DESCRIPTION
	26330	REV. E	INSTRUMENTS, STANDARD
.....	27523	1.00	INSTRUMENT PANEL ASSY
			<i>(See Detail Following and Schematics)</i>
.....	26788	1.00	FUSE PANEL ASSY <i>(See Detail)</i>
.....	35363	1.00	SENDER,PRESS,OIL,02 MP
.....	951250115	1.00	KIT,HORN
.....	35367	1.00	SENDER,TEMP GAUGE,08 MP
.....	35571	1.00	SWITCH,PRESSURE,02 MP,NO & NC
.....	38393	1.00	GAUGE,HYD PRESS,0-3000
.....	80795	3.00	MACH SCR,PH,#6-32X.50
.....	80493	3.00	NUT,HEX,#6-32
.....	80797	3.00	WASHER,SPLIT LOCK,#6
.....	33963	1.00	ALARM,BACKUP
.....	80208	3.00	CSHH,.312-18X1.00,GR5
.....	80037	3.00	NUT,HEX,.312-18
.....	80161	2.00	WASHER,SPLIT LOCK,.312
.....	33964	1.00	SWITCH,BACKUP ALARM
.....	80192	2.00	CSHH,.250-20X.75,GR5
.....	80036	4.00	NUT,HEX,.250-20
.....	80160	4.00	WASHER,SPLIT LOCK,.250
	27523	REV. O	INSTRUMENT PANEL ASSEMBLY
1	21471	1.00	GAUGE PANEL
2	31983	1.00	LIGHT,RED,DASH,.50 HOLE
3	31986	1.00	LIGHT,BLUE,DASH,.50 HOLE
4	33271-1	5.00	WIRE,16 GA,BLACK
5	33271-2	1.50	WIRE,16 GA,YELLOW
6	33271-3	7.00	WIRE,16 GA,BROWN
7	33271-4	3.00	WIRE,16 GA,GREEN
8	33271-8	2.00	WIRE,16 GA,PINK
9	33271-9	1.50	WIRE,16 GA,PURPLE
10	33271-11	2.00	WIRE,16 GA,BLUE
11	33271-12	2.00	WIRE,16 GA,RED/BLACK STRIPE
12	33271-14	3.00	WIRE,16 GA,YELLOW/RED STRIPE
13	33271-15	3.50	WIRE,16 GA,BROWN/YELLOW STRIPE
14	33271-18	1.50	WIRE,16 GA,BLUE/RED STRIPE
15	33382	1.00	SWITCH,STARTER PUSH BUTTON
16	33435	4.00	LIGHT & SOCKET,12V,2.00 GAUGE
17	33600	5.00	TERM,PUSH-ON,.25,FEM,16-14 GA
18	33601	2.00	TERM,BULLET,.156 STD,16-14 GA
19	33608	1.00	TERM,RING,16-14 GA,.312 STUD
20	33610	1.00	TERM,PUSH-ON,.25,FEM,12-10 GA
21	33620	6.00	TERM,RING,12-10 GA,#10 STUD
22	33687	1.00	TURN SIGNAL W/HAZARD
23	34840	3.00	WIRE,14 GA,BLACK
24	35123	29.00	TERM,RING,16-14 GA,#6 STUD

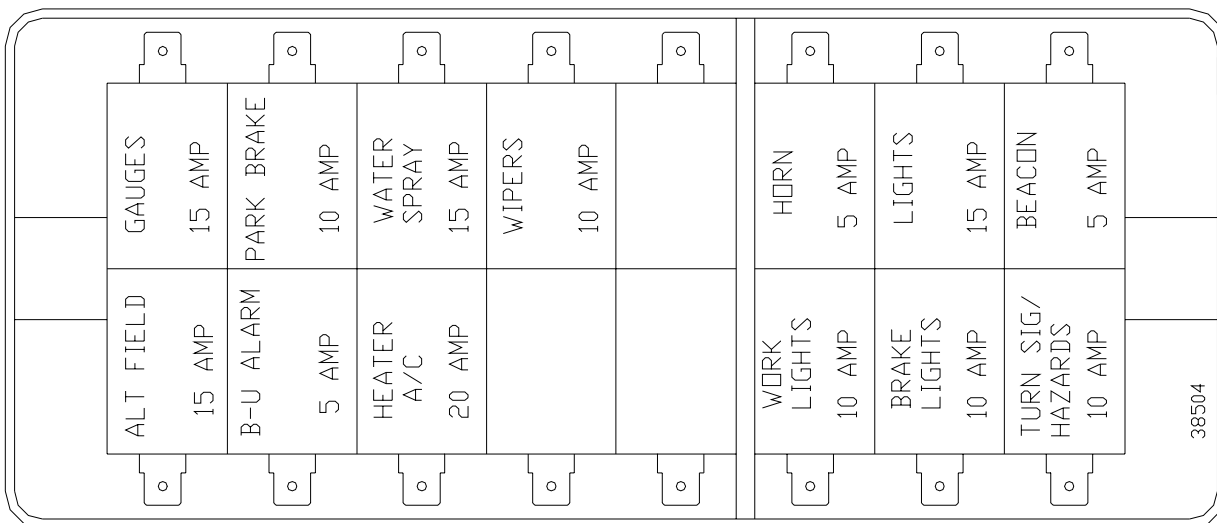


ITEM	PART NO.	QTY.	DESCRIPTION
25	35136-14	1.00	PLUG,HOLE,2.12,FLUSH MT,PLSTC
26	35139	1.00	CONNECTOR,SEALED,TOWER,2-PIN
27	35174	3.00	WIRE,14 GA,PURPLE
28	35213	1.00	HOLDER,WIRE TIE,ADHESIVE BACK
29	35361	1.00	TACHOMETER,ELEC,0-3000 RPM
30	35362	1.00	GAUGE,PRESS,OIL
31	35364	1.00	GAUGE,TEMP,WATER
32	35366	1.00	GAUGE,FUEL
33	35369	1.00	GAUGE,AMMETER,60-0-60
34	35385	1.00	GAUGE,HOUR METER
35	35422	1.00	LIGHT KIT,DATCON TACH
36	35427	1.00	SWITCH,HEADLAMP,PUSH-PULL
37	35447	2.00	SWITCH,TOGGLE,SPST,LIGHTED
38	35926	4.00	TERM,PUSH-ON,.25,FEM,22-18 GA
39	36162	2.00	CONNECTOR,SEALED,SHROUD,6-PIN
40	36163	2.00	CONNECTOR,SEALED,TOWER,6-PIN
41	36164	18.00	TERM,SEALED CONN,16-14 GA,MALE
42	36165	9.00	TERM,SEALED CONN,16-14 GA,FEM
43	36166	23.00	SEAL,CABLE,18-16 GA
44	36349	3.00	TERM,PUSH-ON,.25,FEM,18-14,SLV
45	36350	1.00	CONNECTOR,SEALED,SHROUD,3-PIN
46	36351	1.00	CONNECTOR,SEALED,SHROUD,4-PIN
47	36623	4.00	SEAL,CABLE,14 GA
48	36697	1.00	DECAL,INSTRUMENT PANEL
49	36699	1.00	SWITCH,IGNITION,3 POS,30 AMP
50	71062	7.50	WIRE,14 GA,BLUE
51	71065	3.50	WIRE,14 GA,RED
52	71861-2	4.00	WIRE,10 GA,RED
53	71861-4	1.50	WIRE,10 GA,BLACK
54	72997	1.00	TERM,PUSH-ON,.25,FEM,16-14G,90
55	80140	4.00	WASHER,TYPE A PLAIN,.250
56	80160	4.00	WASHER,SPLIT LOCK,.250
57	81106	4.00	CSBHS,.250-20X.75,SS
58	851091608	1.00	FLASHER,SIGNAL
59	851201417	24.00	TIE WRAP,.094X4.00
60	851390204	5.00	TERM,RING,16-14 GA,#10 STUD

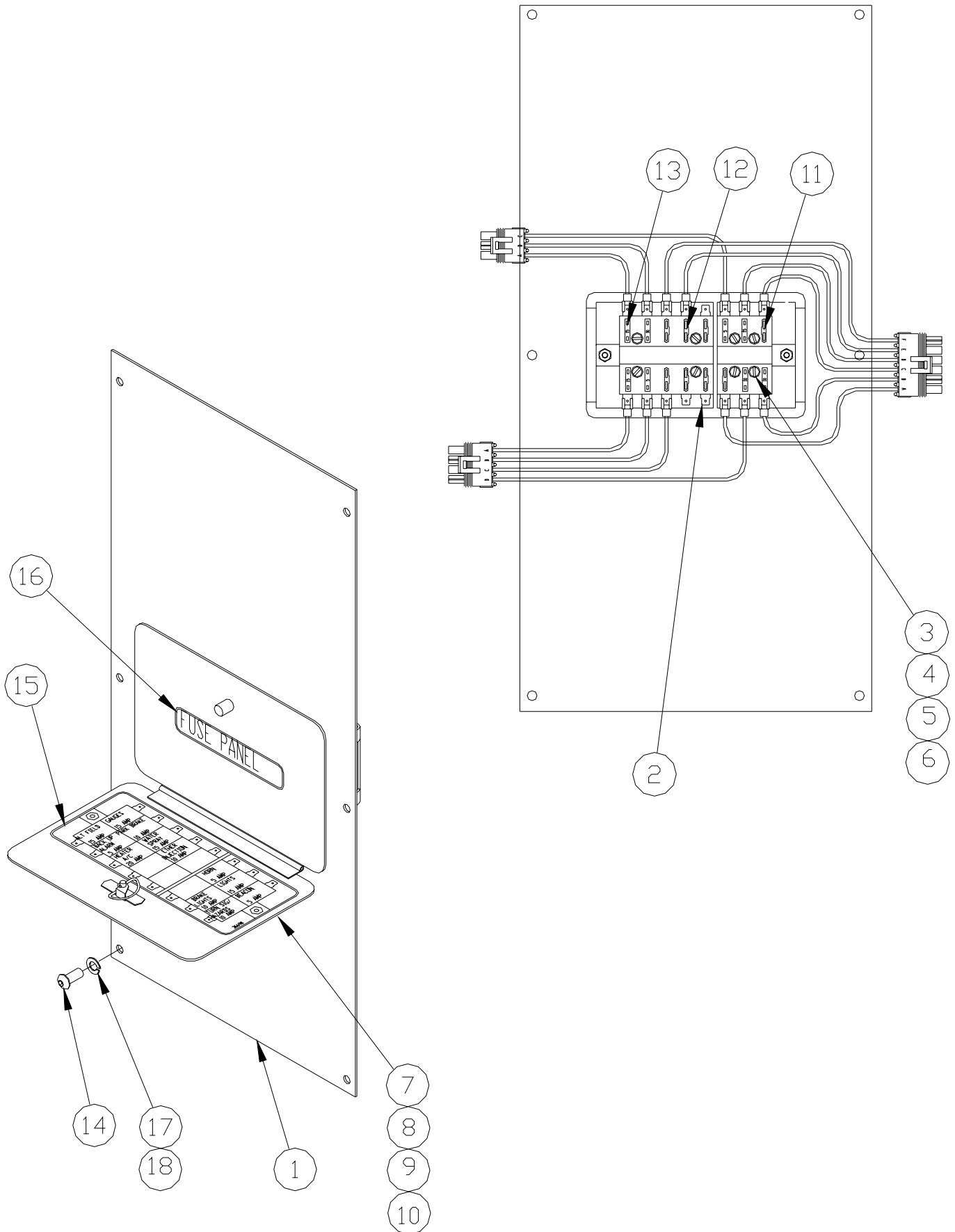
ITEM	PART NO.	QTY.	DESCRIPTION
1	33271-1	1.00	WIRE,16 GA,BLACK
2	33271-12	1.00	WIRE,16 GA,RED/BLACK STRIPE
3	33271-14	1.00	WIRE,16 GA,YELLOW/RED STRIPE
4	33271-15	1.250	WIRE,16 GA,BROWN/YELLOW STRIPE
5	71062	1.250	WIRE,14 GA,BLUE
6	33271-19	1.333	WIRE,16 GA,GREEN/YELLOW STRIPE
7	33271-5	1.00	WIRE,16 GA,WHITE
8	33271-6	1.00	WIRE,16 GA,ORANGE
9	33271-4	1.250	WIRE,16 GA,GREEN
10	33600	13.00	TERM,PUSH-ON,.25,FEM,16-14 GA
11	36163	1.00	CONNECTOR,SEALED,TOWER,6-PIN
12	36165	13.00	TERM,SEALED CONN,16-14 GA,FEM
13	36166	10.00	SEAL,CABLE,18-16 GA
14	36300	1.00	CONNECTOR,SEALED,TOWER,3-PIN
15	36352	1.00	CONNECTOR,SEALED,TOWER,4-PIN
16	36623	3.00	SEAL,CABLE,14 GA
17	36694	1.00	FUSE BLOCK,BLADE TYPE,10 POS
18	36695	1.00	FUSE BLOCK,BLADE TYPE,6 POS
19	35174	1.00	WIRE,14 GA,PURPLE
20	71065	2.00	WIRE,14 GA,RED
21	33271-3	1.250	WIRE,16 GA,BROWN



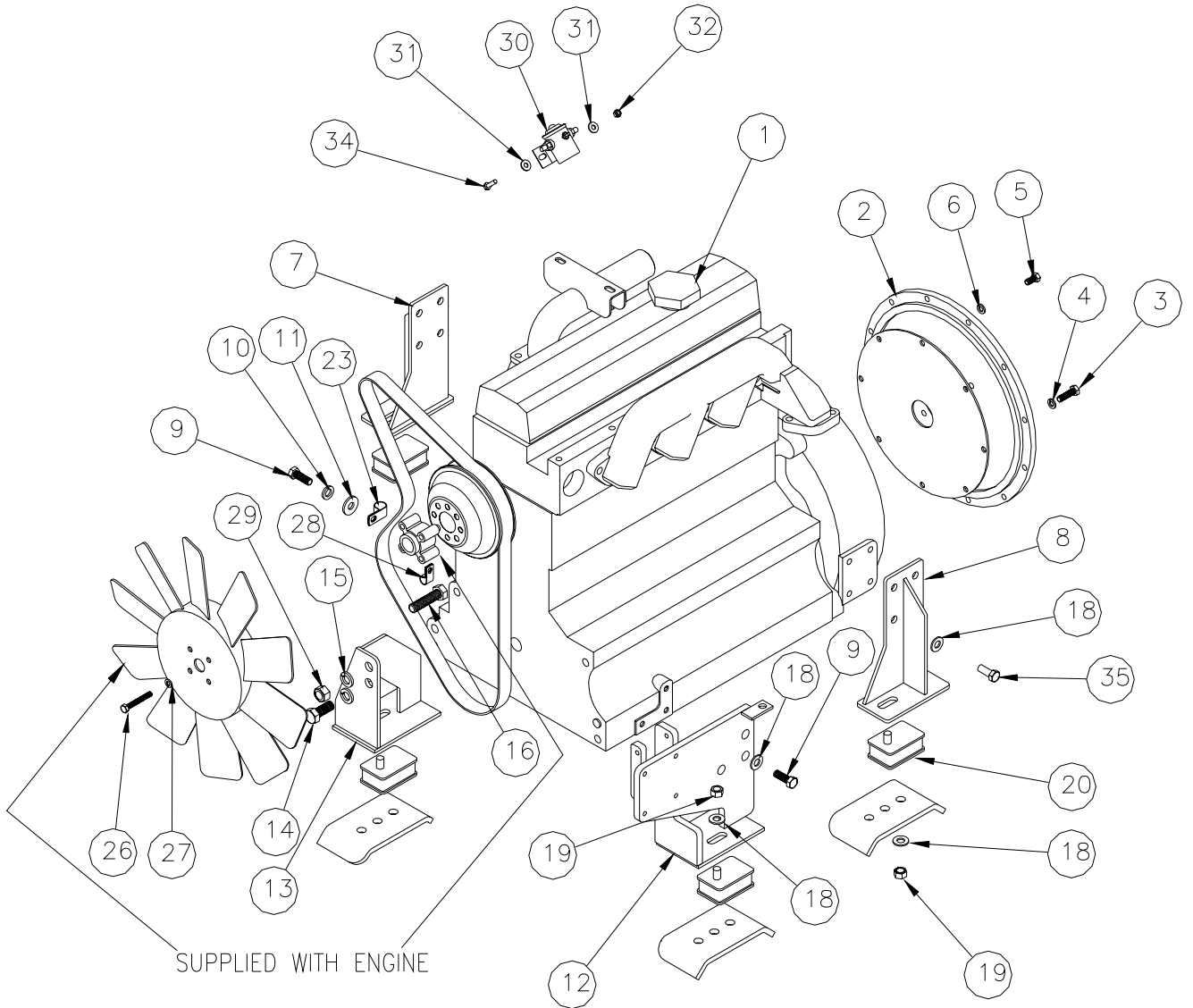
ITEM	PART NO.	QTY.	DESCRIPTION
1	27255	1.00	STEERING CONSOLE COVER,W/M
2	26970	1.00	FUSE PANEL SUB-ASSY
3	80798	8.00	MACH SCR,PH,#10-24X1.00
4	80824	8.00	NUT,HEX,#10-24
5	80995	1.00	WASHER,TYPE A PLAIN,#10
6	871071601	8.00	WASHER,SPLIT LOCK,#10
7	24480	1.00	CONSOLE DOOR, W/M
8	80795	2.00	MACH SCR,PH,#6-32X.50
9	80493	2.00	NUT,HEX,#6-32
10	80797	2.00	WASHER,SPLIT LOCK,#6
11	36746	2.00	FUSE,BLADE,5AMP,ATC-5
12	36340	3.00	FUSE,BLADE,10AMP,ATC-10
13	36341	3.00	FUSE,BLADE,15AMP,ATC-15
14	81106	6.00	CSBHS,.250-20X.75,SS
15	38504	1.00	DECAL,FUSE PANEL (SEE DETAIL BELOW)
16	36696	1.00	DECAL,FUSE LOCATION
17	80160	6.00	WASHER,SPLIT LOCK,.250
18	80140	6.00	WASHER,TYPE A PLAIN,.250



ITEM 15



ITEM	PART NO.	QTY.	DESCRIPTION
1	38309	1.00	ENGINE,JOHN DEERE (See Detail Following)
2	38513	1.00	DRIVE PLATE ASSY,SAE 4
3	80990	12.00	CSHH,M10X1.5X35,CL8.8
4	80478	12.00	WASHER,SPLIT LOCK,M10
5	80972	8.00	CSSH,,375-16X.75
6	80162	8.00	WASHER,SPLIT LOCK,,375
7	26237	1.00	REAR MOTOR MOUNT W/M
8	26241	1.00	REAR MOTOR MOUNT W/M
9	80877	12.00	CSHH,M12X1.75X35,CL8.8
10	80484	12.00	WASHER,SPLIT LOCK,M12
11	80475	12.00	WASHER,PLAIN,M12
12	26767	1.00	FRONT,MOTOR MOUNT W/M
13	26246	1.00	FRONT MOTOR MOUNT W/M
14	81031	1.00	CSHH,M16X2.0X40,CL8.8
15	80166	2.00	WASHER,SPLIT LOCK,,625
16	71640	1.00	CSHH,,625-11X2.50,GR571678
18	81141	19.00	WASHER,SAE,HARDENED,,500
19	80040	8.00	NUT,HEX,,500-13
20	38374	4.00	MOUNT,ENGINE
22	26328	1.00	WIRE HARNESS,JD ENGINE (See Schematics)
23	33595	1.00	CLAMP,LOOP,1.00 OD,REM CUSHION
26	81232	4.00	CSHH,M8X1.25X60,CL10.8
27	80477	4.00	WASHER,SPLIT LOCK,M8
28	871111609	1.00	CLAMP,LOOP,.625 OD,PLSTC COVER
29	80042	1.00	NUT,HEX,,625-11
30	X108	1.00	SOLENOID,INTERMIT DUTY,12VDC
31	80140	4.00	WASHER,TYPE A PLAIN,,250
32	80350	2.00	NUT,FLEXLOC,,250-20,FULL,LT
34	80192	2.00	CSHH,,250-20X.75,GR5
35	81009	8.00	CSHH,M12X1.75X30,CL8.8
	38309		ENGINE, JOHN DEERE
1	38309-01	1.00	MANUAL,OPERATOR,JD TO4O45D
2	38309-02	1.00	PULLEY,AUX DRIVE
3	38309-03	1.00	FAN SPACER
4	38309-04	1.00	FAN,18.O SUCTION,JD
5	38309-05	1.00	PARTS CATALOG,JD ENG
6	38309-06	1.00	FUEL FILTER ELEMENT
7	38309-07	1.00	OIL FILTER
8	38309-08	1.00	CAPOIL FILLER
9	38309-09	1.00	DIPSTICK,ENGINE OIL
10	38309-10	1.00	STARTER
11	38309-11	1.00	ALTERNATOR
12	38309-12	1.00	WIRE HARNESS,ALTERNATOR
13	38309-13	1.00	PIPE,AIR INLET
14	38396	1.00	BELT,FAN,JD ENGINE
15	38309-15	2.00	DECAL,JD ENG.



ITEM	PART NO.	QTY.	DESCRIPTION
1	26285	1.00	REWORK,AIR INLET PIPE
2	26234	1.00	BRACKET,AIR CLEANER
3	81216	2.00	CSHH,M10X1.5X20,CL8.8
4	80478	2.00	WASHER,SPLIT LOCK,M10
5	26439	1.00	GROMMET,AIR CLEANER
6	38375	1.00	ADAPTOR,PIPE,4.0X3.0
7	38376	2.00	CLAMP,T-BOLT,2.25-2.53
8	38268	1.00	CLAMP,T-BOLT,2.53-2.84
9	26231	1.00	AIR CLEANER EXTENSION,W/M
10	80208	6.00	CSHH,.312-18X1.00,GR5
11	80037	6.00	NUT,HEX,.312-18
12	80161	6.00	WASHER,SPLIT LOCK,.312
13	80141	6.00	WASHER,TYPE A PLAIN,.312
15	38385	1.00	AIR CLEANER,3.75IN,3.50 OUT
16	38386	1.00	MOUNTING BAND,8.13 ID
17	38387	1.00	ADPTR,RUBBER 90,2.00ID
18	38388	1.00	ADPTR,RUBBER 180,2.00X3.50
19	36644	1.00	CLAMP,T-BOLT,3.78-4.09
21	853521158	1.00	INDICATOR,AIR CLEANER
22	99610	1.00	PIPE,NIPPLE,02XCLOSE
23	26285-01	1.00	TUBE,RND,2.00 OD X 2.00 LG

26891**REV. O****GRP,AIR INLET HOOD (Standard)**

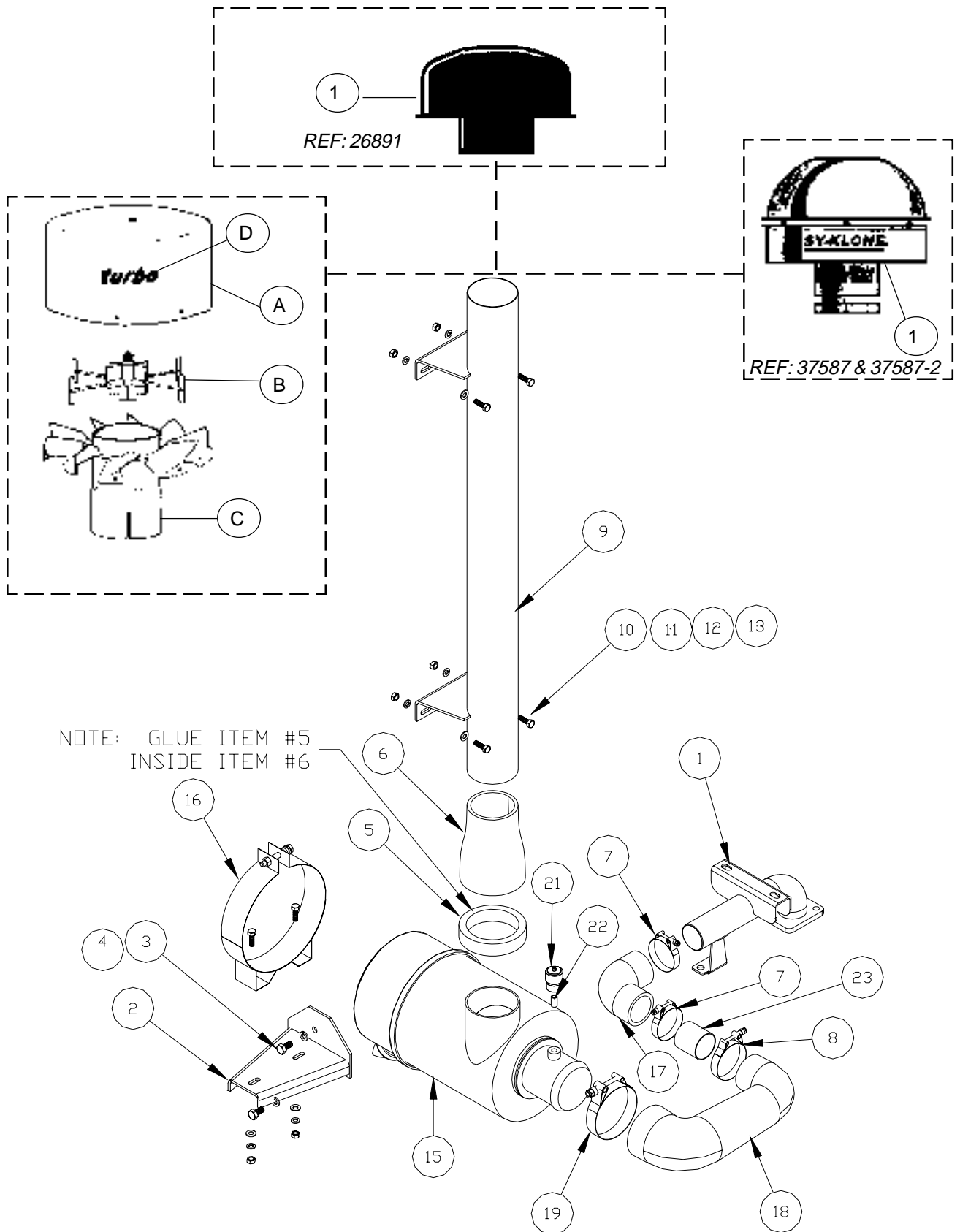
1	38467	1.00	HOOD,AIR INLET,4.00,PL
NS	38270	1.00	INSERT,RUBBER,4.00 TO 3.50

36752**REV. O****PRECLEANER,TURBO,3.75 INLET (Optional)**

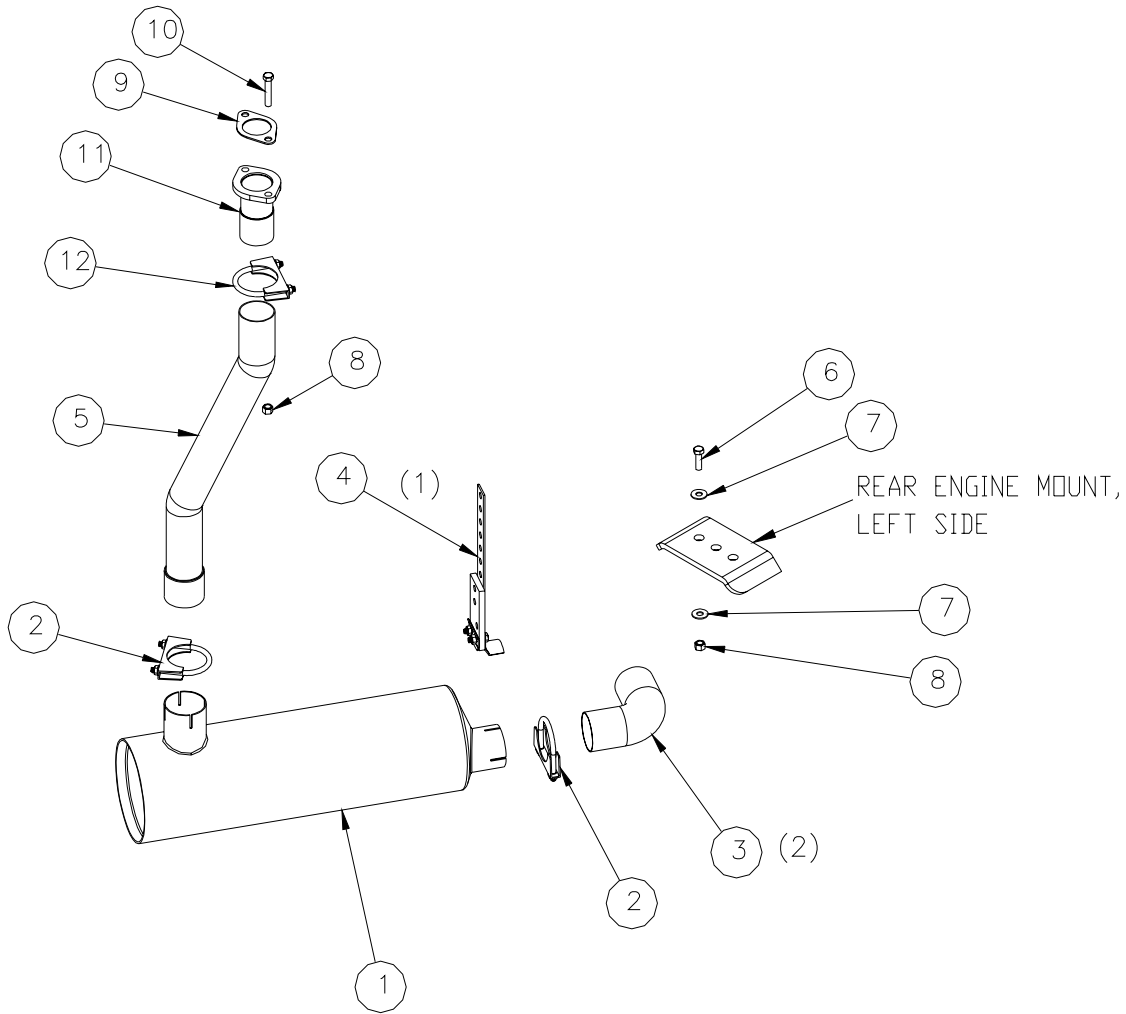
A	36752-01	1.00	HOUSING
B	36752-02	1.00	SPINNER ASSEMBLY
C	36752-03	1.00	VANE ASSEMBLY
D	36752-04	1.00	DECAL,"TURBO" LABEL

37587**REV. O****PRECLEANER, SY-KLONE,3.75 INLET**

	37587-2		INSERT,RUBBER,4.00-3.75"
	37587-3		CLAMP,T-BOLT,PRECLEANER



ITEM	PART NO.	QTY.	DESCRIPTION
1	34074	1.00	MUFFLER,EXH 6.50 OD,2.5 IN/OUT
2	33312	2.00	CLAMP,MUFFLER,2.5
3	36117	1.00	ELBOW,EXHAUST,SR90,2.50 OD
4	38380	1.00	HANGER,EXHAUST PIPE
5	38524	1.00	PIPE,EXHAUST,J/D ENGINE
6	80224	1.00	CSHH,.375-16X1.25,GR5
7	80142	2.00	WASHER,TYPE A PLAIN,.375
8	80352	3.00	NUT,FLEXLOC,.375-16,FULL,LT
9	38400	1.00	GASKET,EXHAUST,JD ENG
10	80230	2.00	CSHH,.375-16X2.00,GR5
11	27003	1.00	W/M,EXH FLANGE,J/D ENGINE
12	37720	1.00	CLAMP,MUFFLER,2.25



1. BEND STRAP OVER AS REQUIRED, MOUNT TO OPEN HOLE IN THE ENGINE MOUNT.
2. POINT ELBOW TOWARD REAR OF MACHINE AND SLIGHTLY DOWN.

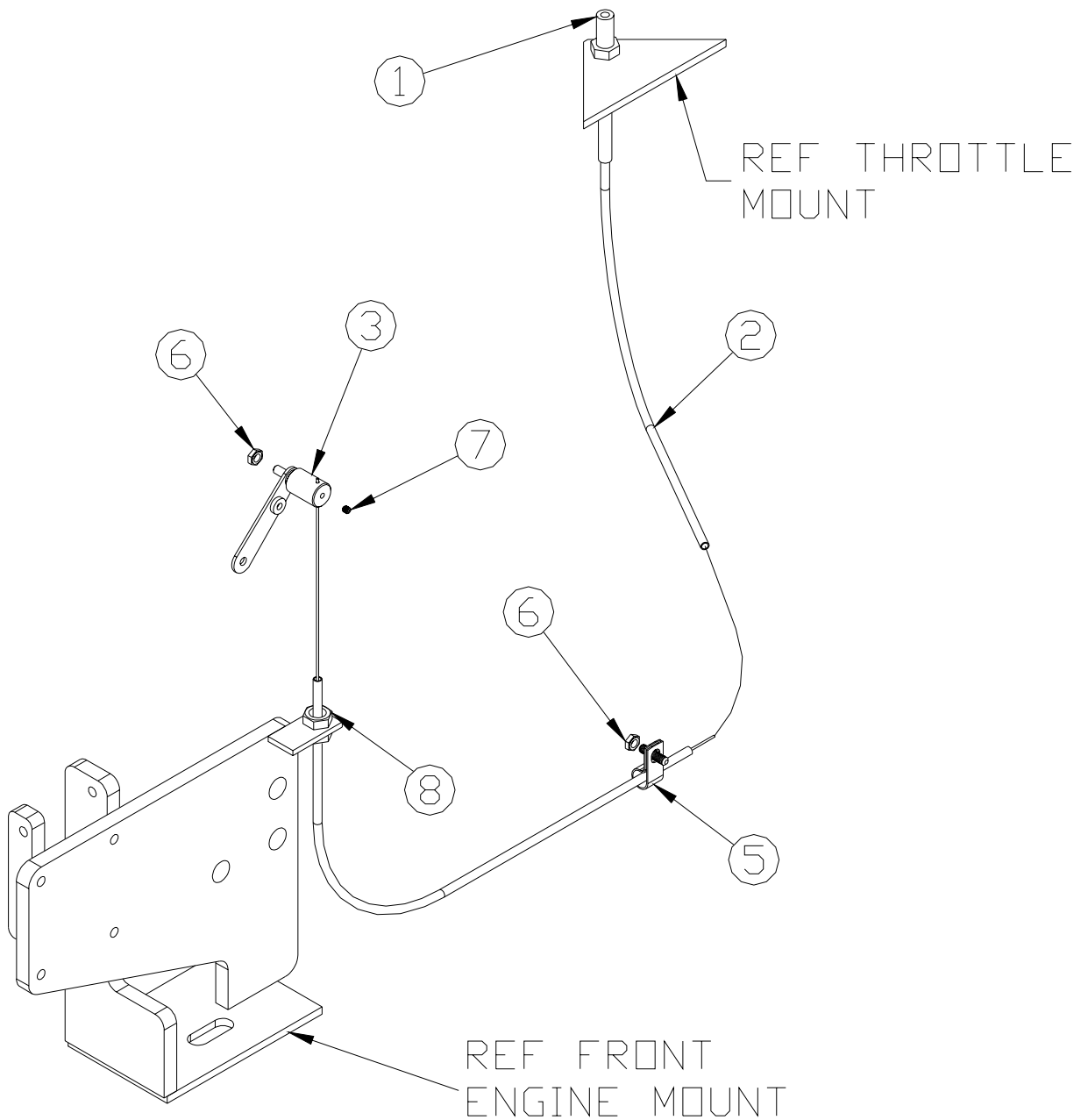
Challenger II

REF: 26434

REV: A

THROTTLE ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1	38362	1.00	CABLE,THROTTLE,VERNIER,10 FT
2	38363	1.00	BULKHEAD FTG,THROTTLE CABLE
3	26458	1.00	PIVOT,INJ PUMP LEVER
5	871111605	1.00	CLAMP,LOOP,.50 OD PLSTC COVER
6	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
7	80424	1.00	SET S,CUP,#10-32X.25
8	80093	1.00	NUT,HEX,JAM,500-20



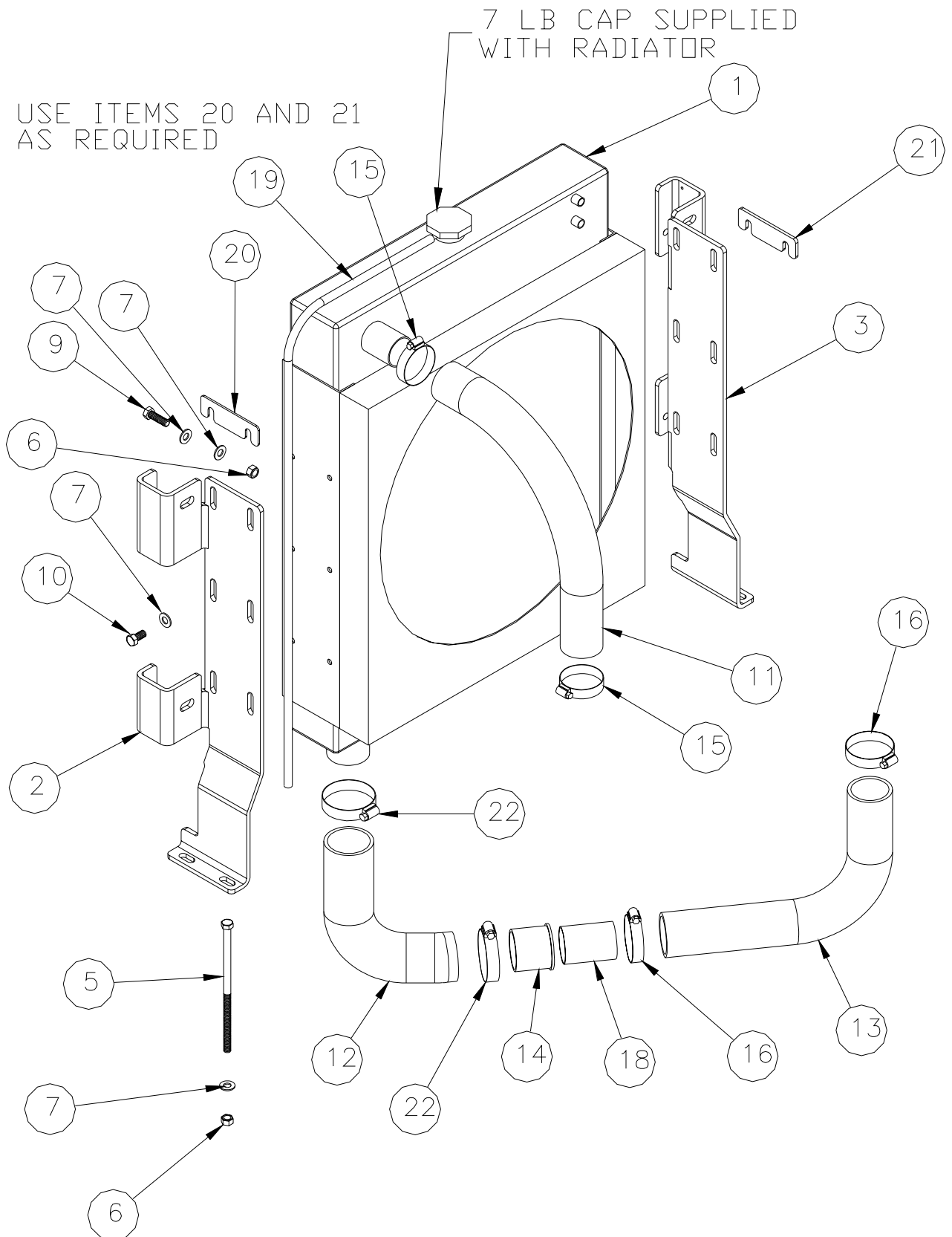
RADIATOR ASSEMBLY

Challenger II

REF: 27128

REV: B

ITEM	PART NO.	QTY.	DESCRIPTION
1	38530	1.00	RADIATOR AND SHROUD
1a	38530-01	1.00	CAP,RADIATOR,7 PSI
2	27102	1.00	RADIATOR MOUNT,RH
3	27101	1.00	RADIATOR MOUNT,LH
5	80802	4.00	CSHH,.375-16X7.00,GR5
6	80038	8.00	NUT,HEX,.375-16
7	81155	24.00	WASHER,SAE,HARDENED,.375
9	80221	4.00	CSHH,.375-16X1.00,GR5
10	80219	12.00	CSHH,.375-16X.75,GR5
11	26909	1.00	HOSE,RADIATOR,UPPER,J/D
12	26910	1.00	HOSE,RADIATOR,LOWER,J/D
13	26911	1.00	HOSE,RADIATOR,LOWER ENG,J/D
14	38384	1.00	REDUCER,RADIATOR HOSE
15	33169	2.00	CLAMP,HOSE,1.31-2.25,WORM #28
16	33170	2.00	CLAMP,HOSE,1.56-2.50,WORM,#32
18	90376-01	1.00	TUBE,RND,2.00 ODX16GA,2.75 LG
19	90972	4.00	HOSE,05,RAD OVERFLOW
20	27259	2.00	SPACER,RADIATOR MOUNT,.1046
21	27260	2.00	SPACER,RADIATOR MOUNT,.1793
22	33171	2.00	CLAMP,HOSE,1.81-2.75,WORM,#36

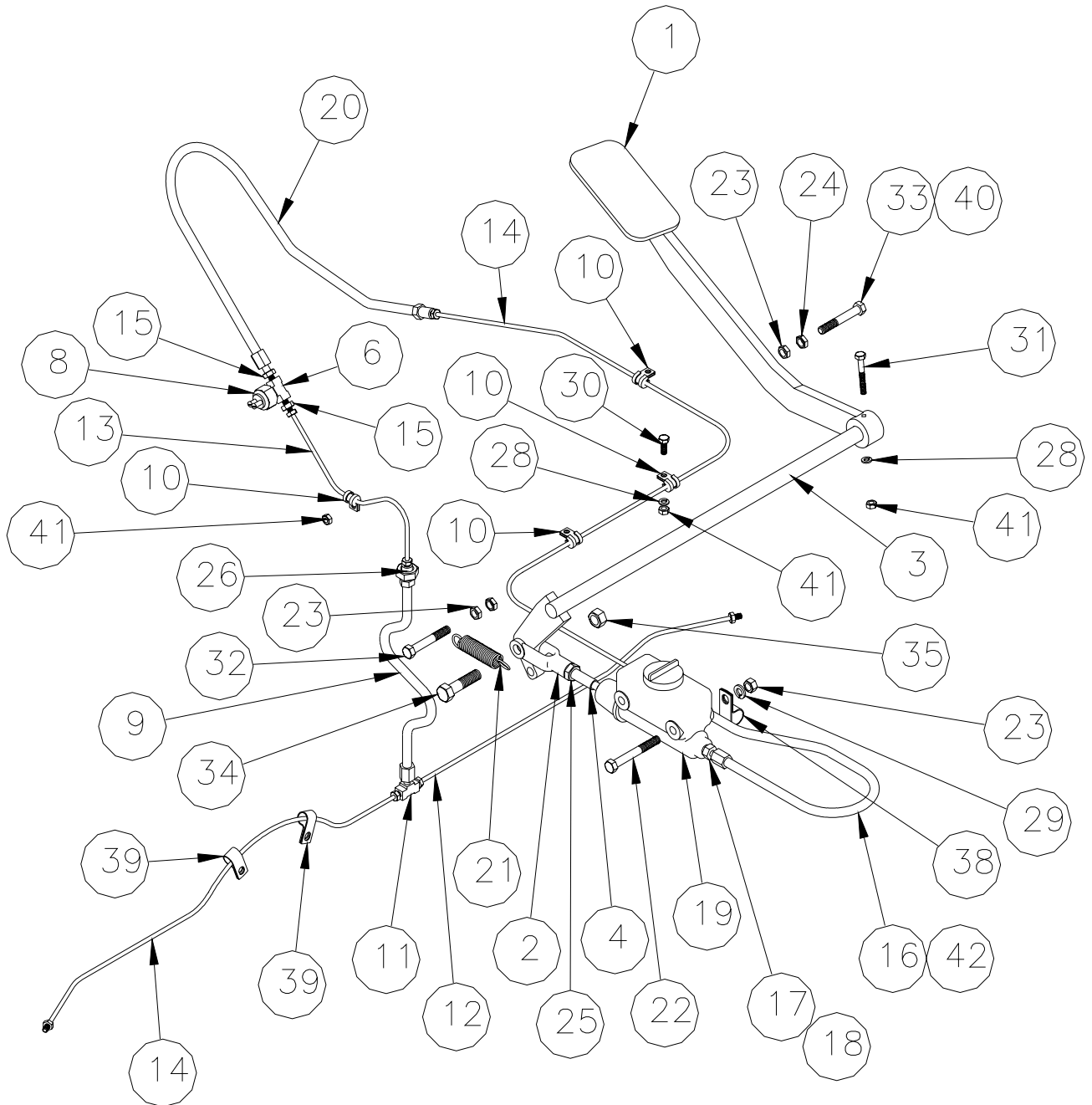


HYDRAULIC BRAKE ASSEMBLY

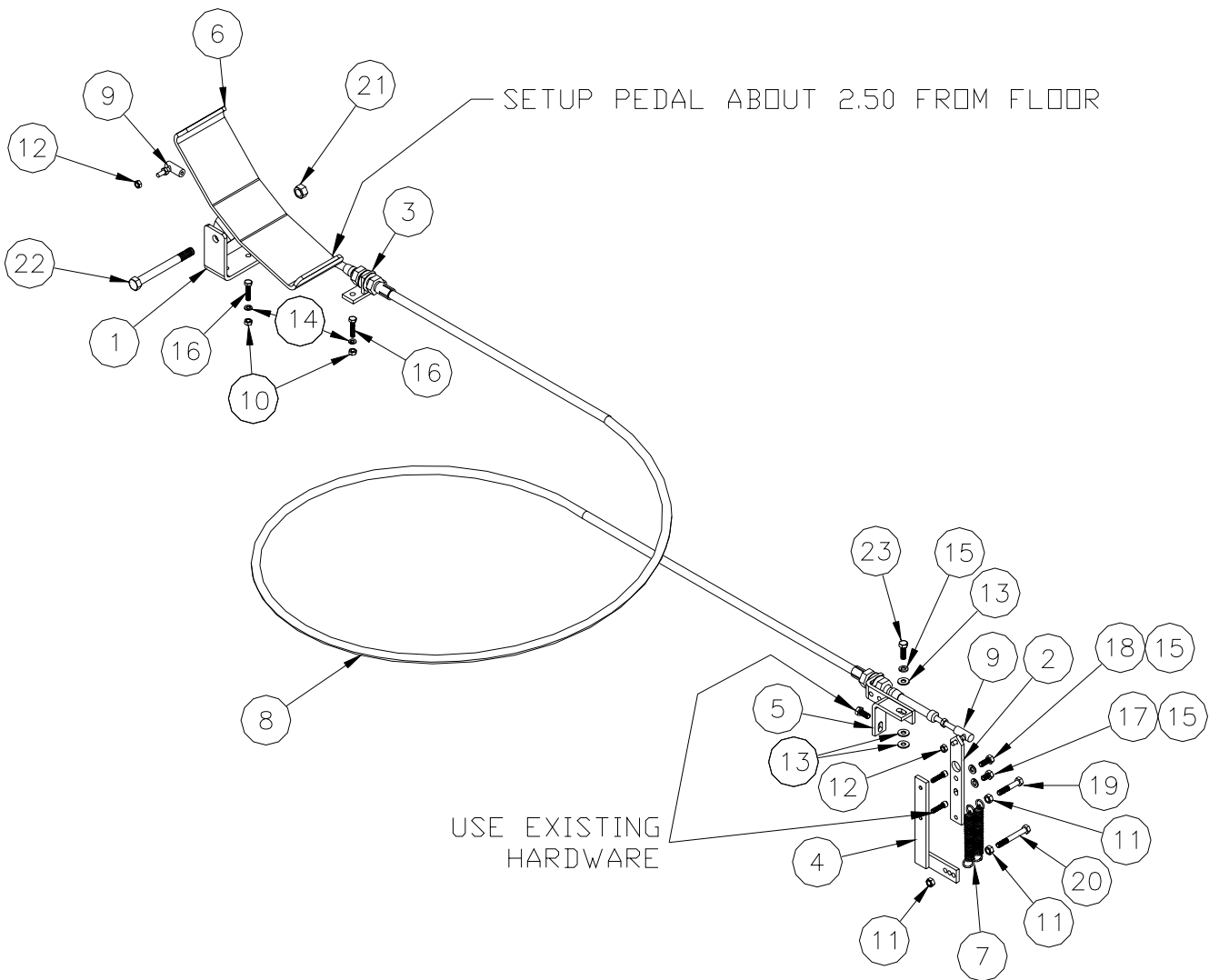
Challenger II

REF: 27028
REV: A

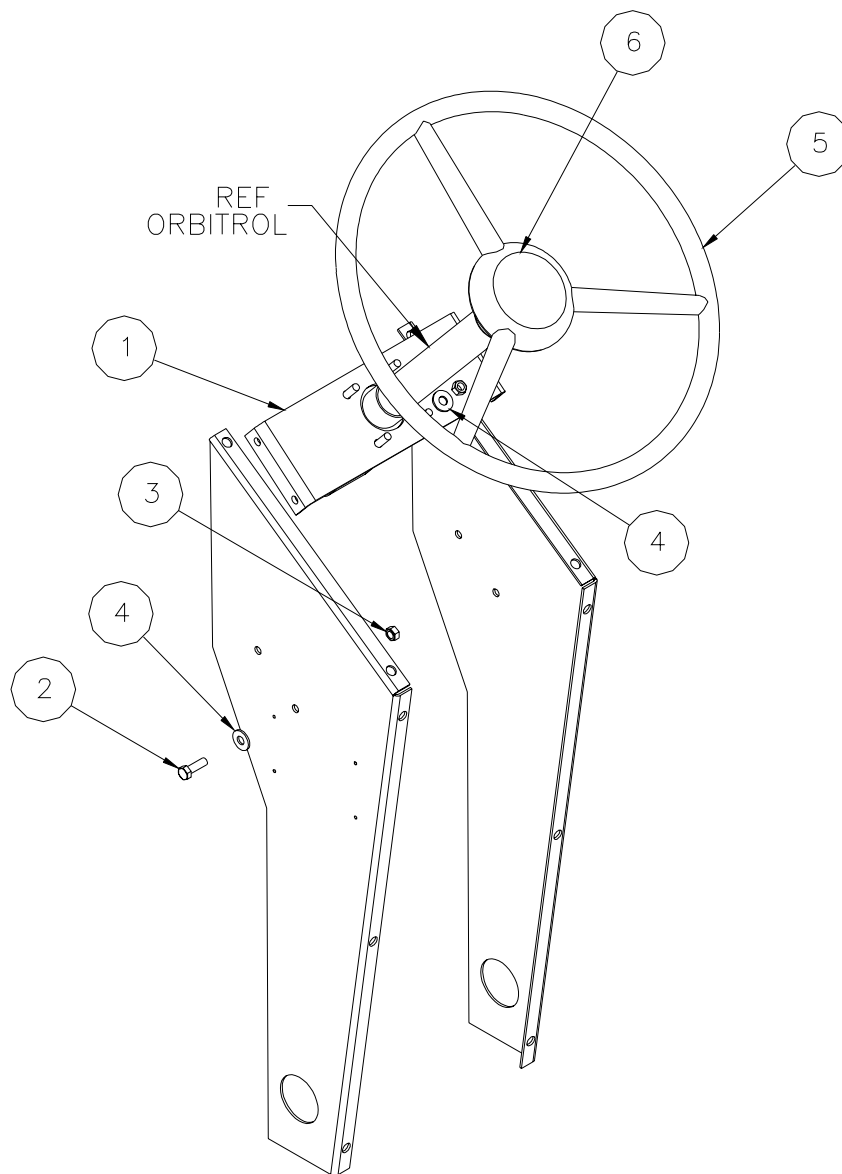
ITEM	PART NO.	QTY.	DESCRIPTION
1	27027	1.00	W/M,BRAKE PEDAL
2	871100609	1.00	CLEVIS,.500-20
3	27010	1.00	W/M,SHAFT,BRAKE PEDAL
4	26871	1.00	ROD,MASTER CYL,.500-20 UNF
6	32101	1.00	FITT,TEE 04IFF-04IFF-02FP,BRS
8	32131	1.00	SWITCH,STOP LAMP,HYD TYPE,NO
9	32953	1.00	BRAKE HOSE ASSY
10	33594	4.00	CLAMP,LOOP,.25 OD,REM CUSHION
11	33949	1.00	FITT,TEE 03IFF,BRASS
12	33953-20	1.00	BRAKE LINE,.188x20
13	33953-10	1.00	BRAKE LINE,.188x10
14	33953-4A	2.00	BRAKE LINE,.188X40
15	34068	2.00	ADAPTER
16	36693	1.00	BRAKE HOSE ASSY,.375-24X14.25
17	38277	1.00	FITT,MASTER CYL ADAPTOR
18	38278	1.00	GASKET,MASTER CYL
19	38314	1.00	BRAKE,MASTER CYL
20	38361	1.00	BRAKE HOSE,.38-24X18.81
21	36800	1.00	SPR,EXT,.88 OD X .091 X 3.50
22	71620	2.00	CSHH,.375-16X3.00,GR5
23	80038	5.00	NUT,HEX,.375-16
24	80074	1.00	NUT,HEX,JAM,.375-16
25	80093	1.00	NUT,HEX,JAM,.500-20
26	80095	1.00	NUT,HEX,JAM,.625-18
28	80160	4.00	WASHER,SPLIT LOCK,.250
29	80162	2.00	WASHER,SPLIT LOCK,.375
30	80192	3.00	CSHH,.250-20X.75,GR5
31	80196	1.00	CSHH,.250-20X2.00,GR5
32	80230	1.00	CSHH,.375-16X2.00,GR5
33	80232	1.00	CSHH,.375-16X2.50,GR5
34	80255	1.00	CSHH,.500-13X2.00,GR5
35	80354	1.00	NUT,FLEXLOC,.500-13,FULL,LT
38	871111602	1.00	CLAMP,LOOP,.75 OD,PLSTC COVER
39	871111605	2.00	CLAMP,LOOP,.50 OD PLSTC COVER
40	X341	.12	HOSE,06,PUSH-ON,250,BLUE
41	80036	4.00	NUT,HEX,.250-20
42	71870	1.30	LOOM,SPLIT,CONVOLUTED,.750

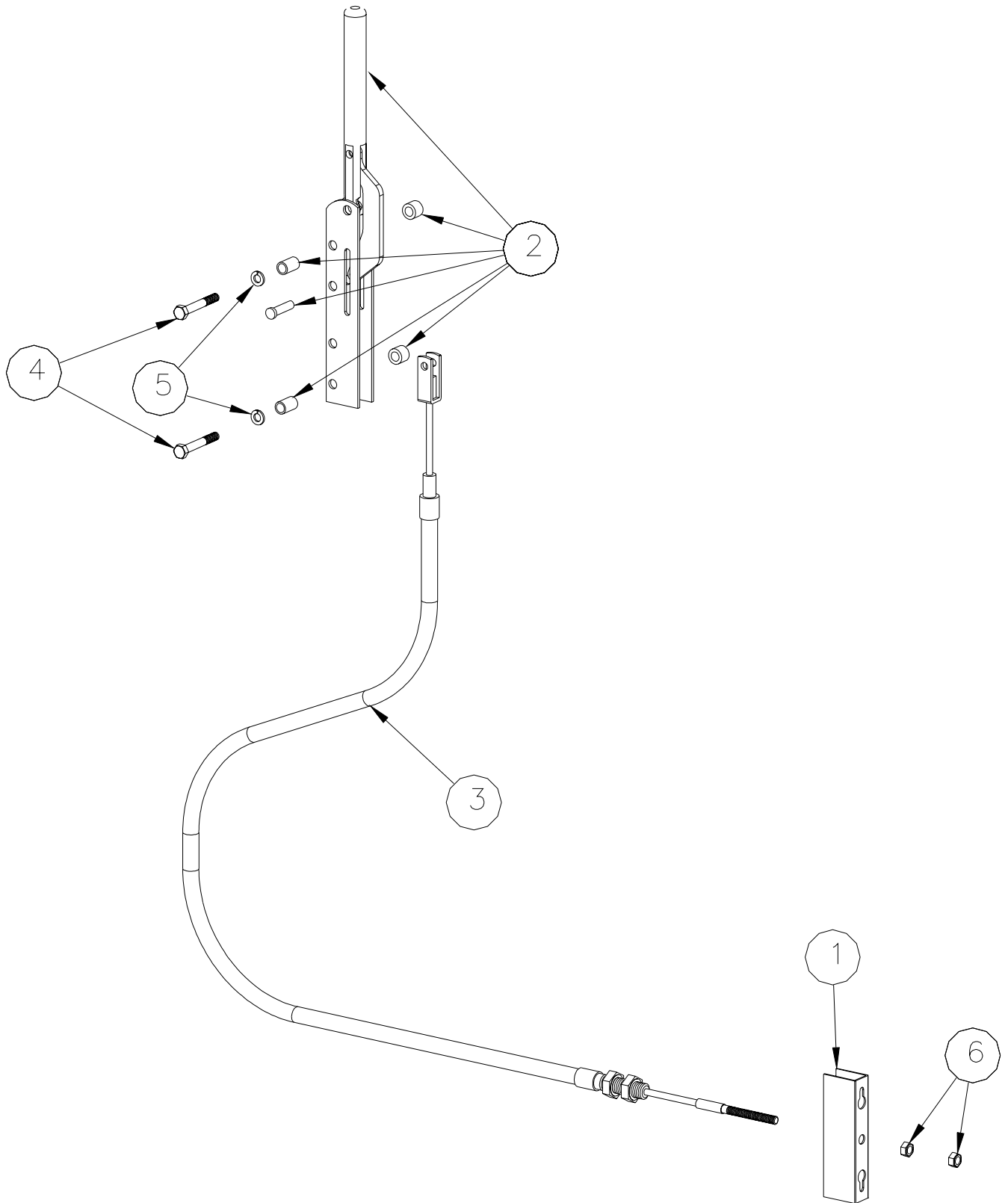


ITEM	PART NO.	QTY.	DESCRIPTION
1	26198	1.00	BRACKET,FOOT PEDAL
2	26228	1.00	SHIFT LEVER,HYD PUMP
3	26287	1.00	DIRECTIONAL MNT BRKT,W/M
4	26294	1.00	SPRING BRACKET,W/M
5	26436	1.00	PUMP CABLE BRACKET,W/M
6	26443	1.00	FOOT PEDAL,W/M
7	36800	2.00	SPR,EXT,.88 OD X .091 X 3.50
8	38364	1.00	CABLE,CONTROL,72.0
9	38365	2.00	CABLE END,BALL JOINT
10	80036	4.00	NUT,HEX,.250-20
11	80037	3.00	NUT,HEX,.312-18
12	80054	2.00	NUT,HEX,.250-28
13	80140	3.00	WASHER,TYPE A PLAIN,.250
14	80160	4.00	WASHER,SPLIT LOCK,.250
15	80161	3.00	WASHER,SPLIT LOCK,.312
16	80187	4.00	CSHH,.250-20X1.25,GR5
17	80202	1.00	CSHH,.312-18X.50,GR5
18	80207	1.00	CSHH,.312-18X.75,GR5
19	80211	1.00	CSHH,.312-18X1.75,GR5
20	80215	1.00	CSHH,.312-18X2.50,GR5
21	80354	1.00	NUT,FLEXLOC,.500-13,FULL,LT
22	80403	1.00	CSHH,.500-13X5.00,GR5
23	80492	1.00	CSHH,M8X1.25X30,CL8.8

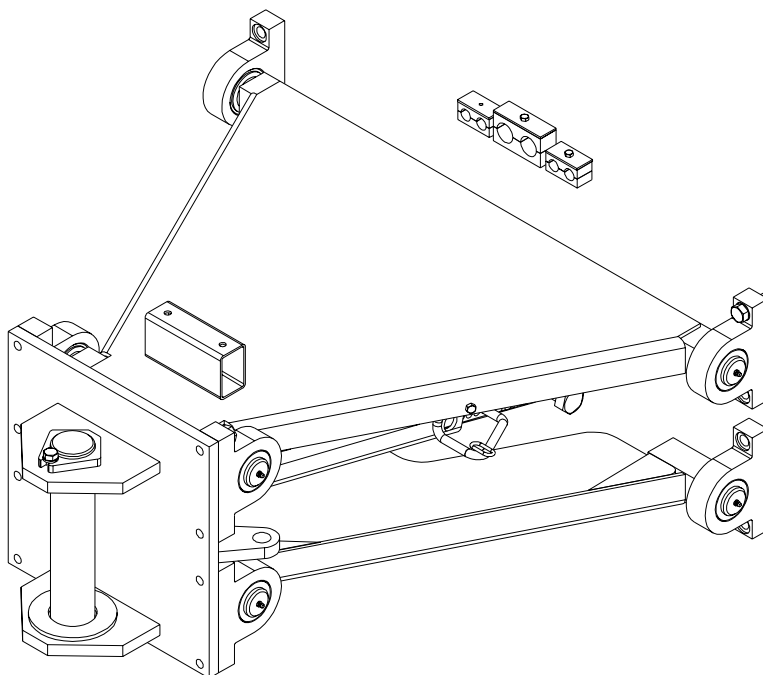


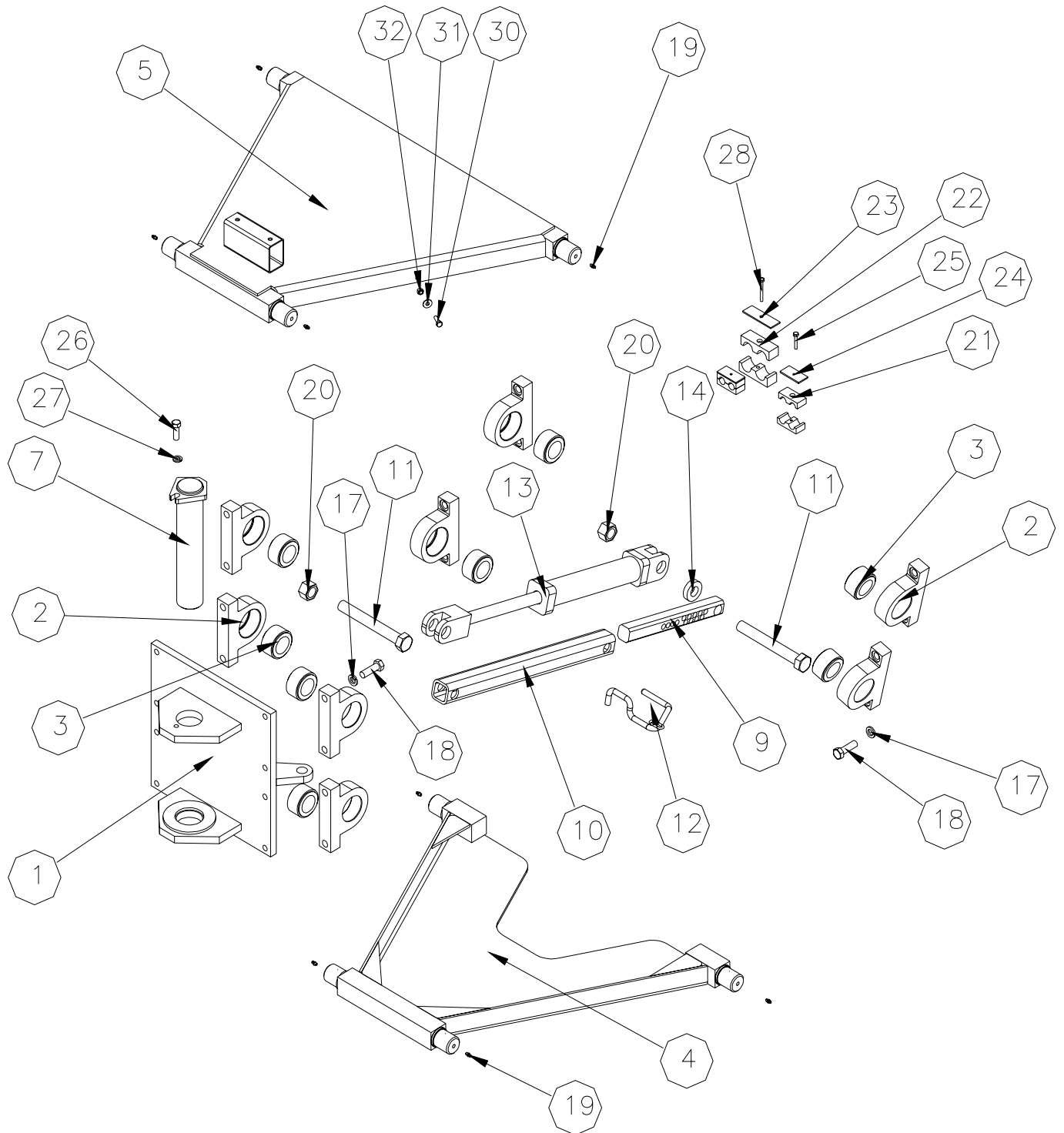
ITEM	PART NO.	QTY.	DESCRIPTION
	26282	REV. B	PARK BRAKE ASSEMBLY
1	38359	1.00	BRAKE CABLE EQUILIZER
2	38366	1.00	PARK BRAKE LEVER
3	38367	1.00	PARK BRAKE CABLE
4	80214	2.00	CSHH,.312-18X2.25,GR5
5	80161	2.00	WASHER,SPLIT LOCK,.312
6	80055	2.00	NUT,HEX,.312-24
	27525	REV. A	STEERING, ORBITROL, MOUNT ASSY
1	21075	1.00	MOUNT,STEERING ORBITROL
2	80208	4.00	CSHH,.312-18X1.00,GR5
3	80037	4.00	NUT,HEX,.312-18
4	81130	8.00	WASHER,SAE,HARDENED,.312
5	6436	1.00	STEERING WHEEL
6	71077	1.00	CAP,ST WL,REF 6436





ITEM	PART NO.	QTY.	DESCRIPTION
1	26599	1.00	FRONT YOKE,W/M
2	26583	8.00	PILLOW BLOCK
3	38293	8.00	BEARING,1.75,SPHERE,PLAIN
4	27240	1.00	LIFT PLATE,BOTTOM,W/M
5	27239	1.00	LIFT PLATE,TOP,W/M
7	27280	1.00	MAIN PIVOT PIN,W/M
9	26591	1.00	HEIGHT ADJ BAR,MALE
10	26589	1.00	HEIGHT ADJ TUBE,FEMALE
11	27846	2.00	BOLT,REWORK
12	26594	1.00	ADJ STOP PIN,W/M
13	38549	1.00	CYL,HYD,3.0X12.0
	38549-01		SEAL KIT,HYD CYL,3BX1.25R
14	26580	1.00	SPACER
17	80166	16.00	WASHER,SPLIT LOCK,.625
18	80983	16.00	CSHH,.625-11X2.00,GR8
19	33684	8.00	FITT,LUBE,STR,02MP,SHORT
20	80359	2.00	NUT,FLEXLOC,1.000-8,FULL,LT
21	34860	4.00	CLAMP,HALF,HOSE,.750
22	38280	2.00	CLAMP,HALF,HOSE 1.25
23	35541	1.00	CLAMP COVER PLATE
24	34861	2.00	COVER PLATE,HOSE CLAMP
25	80194	2.00	CSHH,.250-20X1.50,GR5
26	81113	1.00	CSHH,.500-13X1.50,GR8
27	80164	1.00	WASHER,SPLIT LOCK,.500
28	80197	1.00	CSHH,.250-20X2.25,GR5
30	80208	1.00	CSHH,.312-18X1.00,GR5
31	80141	1.00	WASHER,TYPE A PLAIN,.312
32	80351	1.00	NUT,FLEXLOC,.312-18,FULL,LT



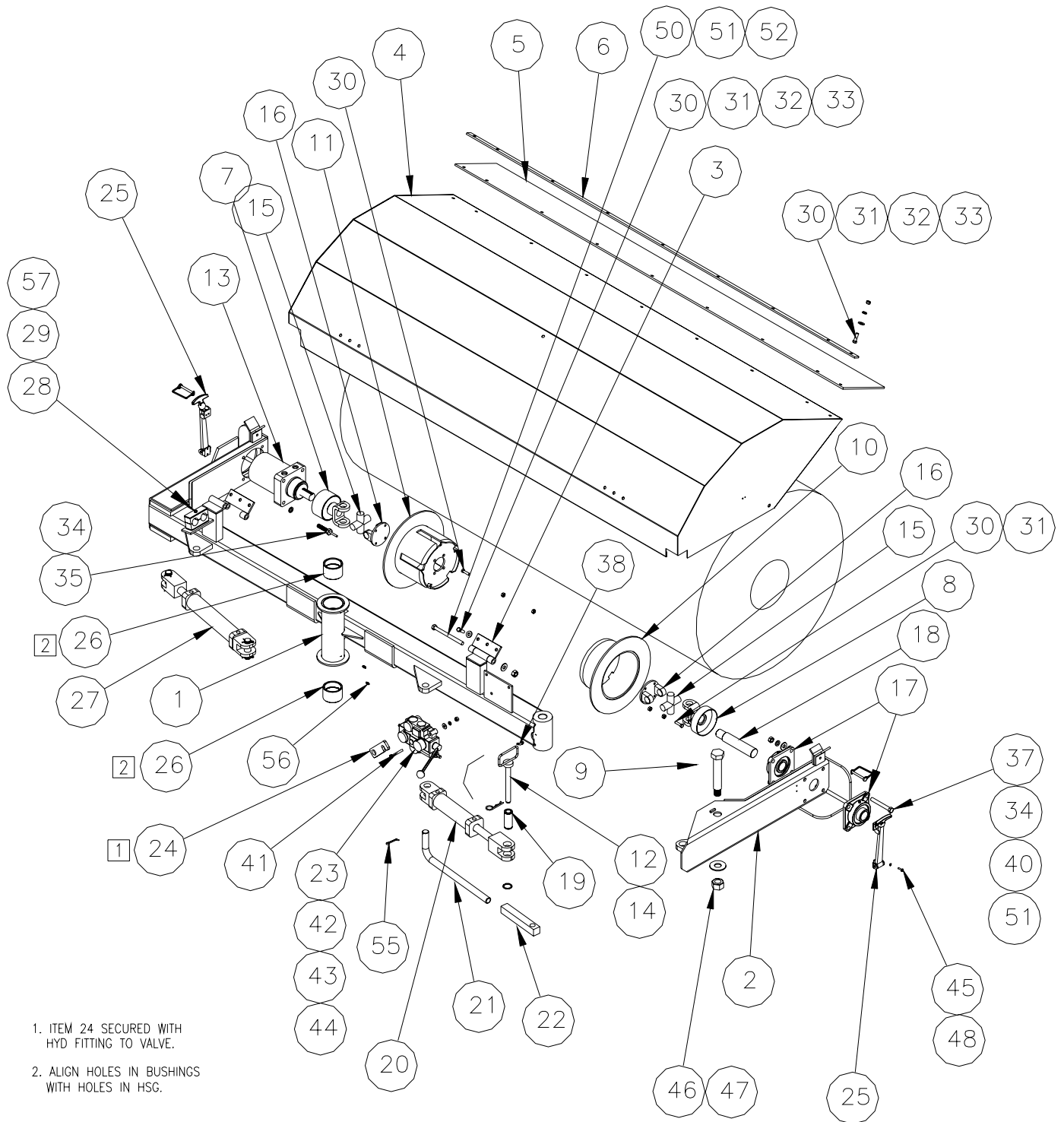


7 FOOT BRUSH FRAME ASSEMBLY

Challenger II

REF: 26317
REV: E

ITEM	PART NO.	QTY.	DESCRIPTION
1	26572	1.00	BRUSH FRAME,W/M
2	26571	1.00	QUICK CHG ARM,W/M
3	26531	2.00	BRUSH HINGE,W/M
4	26535	1.00	BRUSH COVER,W/M
5	26550	1.00	APRON
6	26551	1.00	PLATE,APRON
7	26951	1.00	DRIVE HUB GUARD,W/M
8	26954	1.00	IDLE HUB GUARD,W/M
9	26558	1.00	SWING ARM BOLT
10	26549	1.00	IDLE HUB,W/M
11	26547	1.00	DRIVE HUB,W/M
12	38511	1.00	PIN,HITCH,.750X6.50 GRIP
13	38286	1.00	MOTOR,HYD
14	81237	2.00	RING,RETAINING EXT 1.250 SHAFT
15	38294	2.00	KIT,BEARING CROSS
16	38285	2.00	YOKE,FLANGE
17	845311009	2.00	BEARING,FLANGE,1.50,4 BOLT
18	26520	1.00	IDLE SHAFT PIN
19	26523	1.00	QUICK CLAMP SLEEVE
20	38546	1.00	CYL,HYD,2.0X6.0
	38546-01		SEAL KIT,HYD CYL,2BX1.12R
21	26557	1.00	QUICK CHANGE BAR
22	26524	1.00	QUICK CHANGE LEVER BOLT
23	38307	1.00	VLV,HYD,SINGLE SPOOL
24	26522	1.00	LATCH BAR
25	38576	2.00	LATCH,T-HANDLE
26	26521	2.00	PIVOT BUSHING,BRUSH FRAME
27	38548	1.00	CYL,HYD,2.0X8.0
	38546-01		SEAL KIT,HYD CYL,2BX1.12R
28	38280	2.00	CLAMP,HALF,HOSE 1.25
29	35541	1.00	CLAMP COVER PLATE
30	80224	23.00	CSHH,.375-16X1.25,GR5
31	80038	31.00	NUT,HEX,.375-16
32	80142	15.00	WASHER,TYPE A PLAIN,.375
33	80162	15.00	WASHER,SPLIT LOCK,.375
34	80164	8.00	WASHER,SPLIT LOCK,.500
35	26959	4.00	DRIVE HUB BOLT,MODIFIED
37	80722	4.00	CSHH,.500-13X4.00,GR5
38	33683	1.00	FITT,LUBE,45,02MP
40	80040	4.00	NUT,HEX,.500-13
41	80214	3.00	CSHH,.312-18X2.25,GR5
42	80141	3.00	WASHER,TYPE A PLAIN,.312
43	80161	3.00	WASHER,SPLIT LOCK,.312
44	80037	3.00	NUT,HEX,.312-18
45	71716	8.00	MACH SCR,PH,#10-24X.75

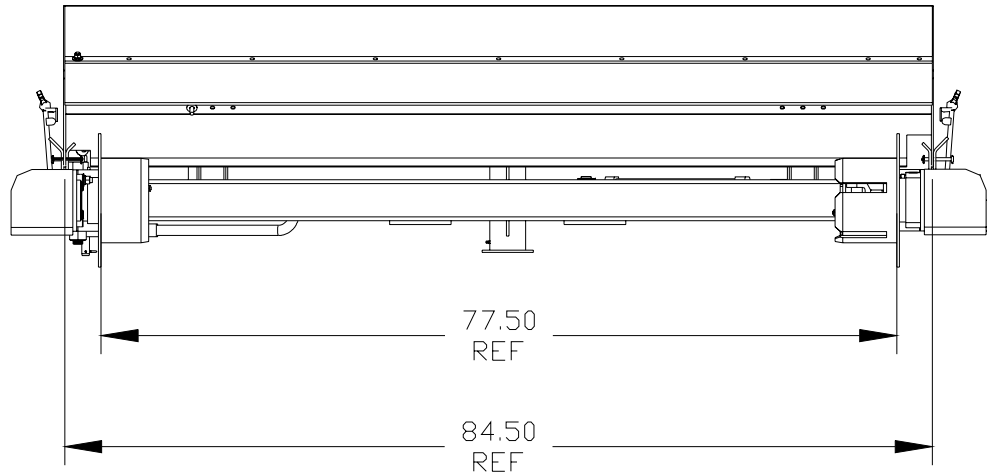


7 FOOT BRUSH FRAME ASSEMBLY

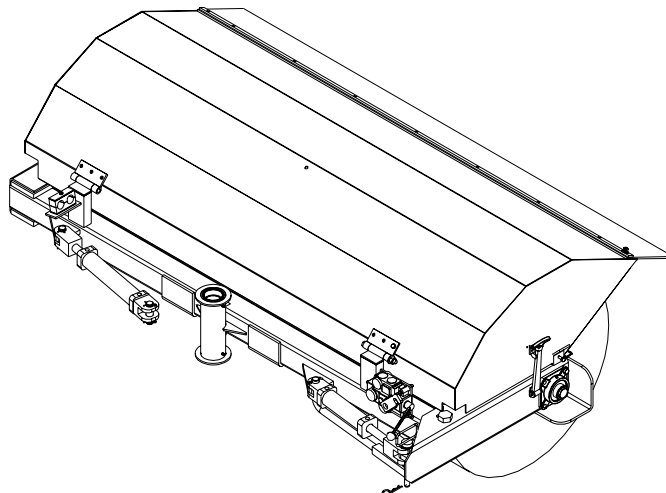
Challenger II

REF: 26317
REV: E

ITEM	PART NO.	QTY.	DESCRIPTION
46	80359	1.00	NUT,FLEXLOC,1.000-8,FULL,LT
47	80149	1.00	WASHER,TYPE A PLAIN,1.000
48	871071601	8.00	WASHER,SPLIT LOCK,#10
50	80467	2.00	CSHH,.500-13X6.00,GR5
51	80144	6.00	WASHER,TYPE A PLAIN,.500
52	80354	2.00	NUT,FLEXLOC,.500-13,FULL,LT
55	80336	1.00	COTTER PIN,.188X1.50
56	33684	2.00	FITT,LUBE,STR,02MP,SHORT
57	80197	1.00	CSHH,.250-20X2.25,GR5



FRONT VIEW
SET UP BEFORE PUTTING ON THE BRUSH



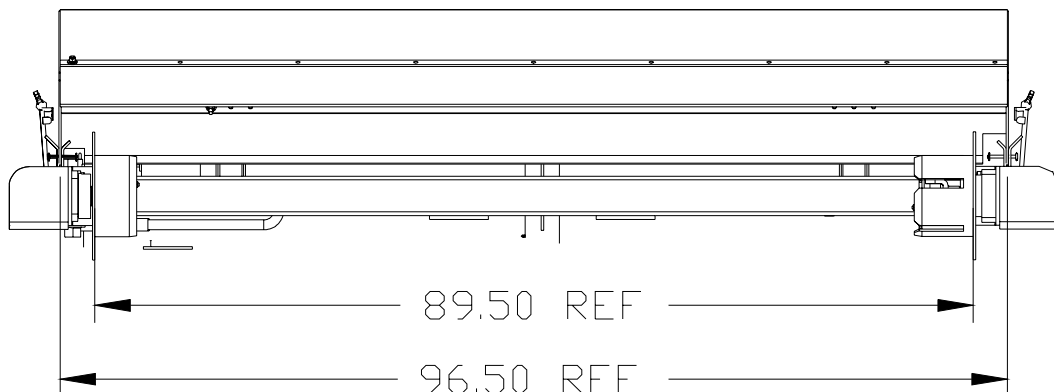
8 FOOT BRUSH FRAME ASSEMBLY

Challenger II

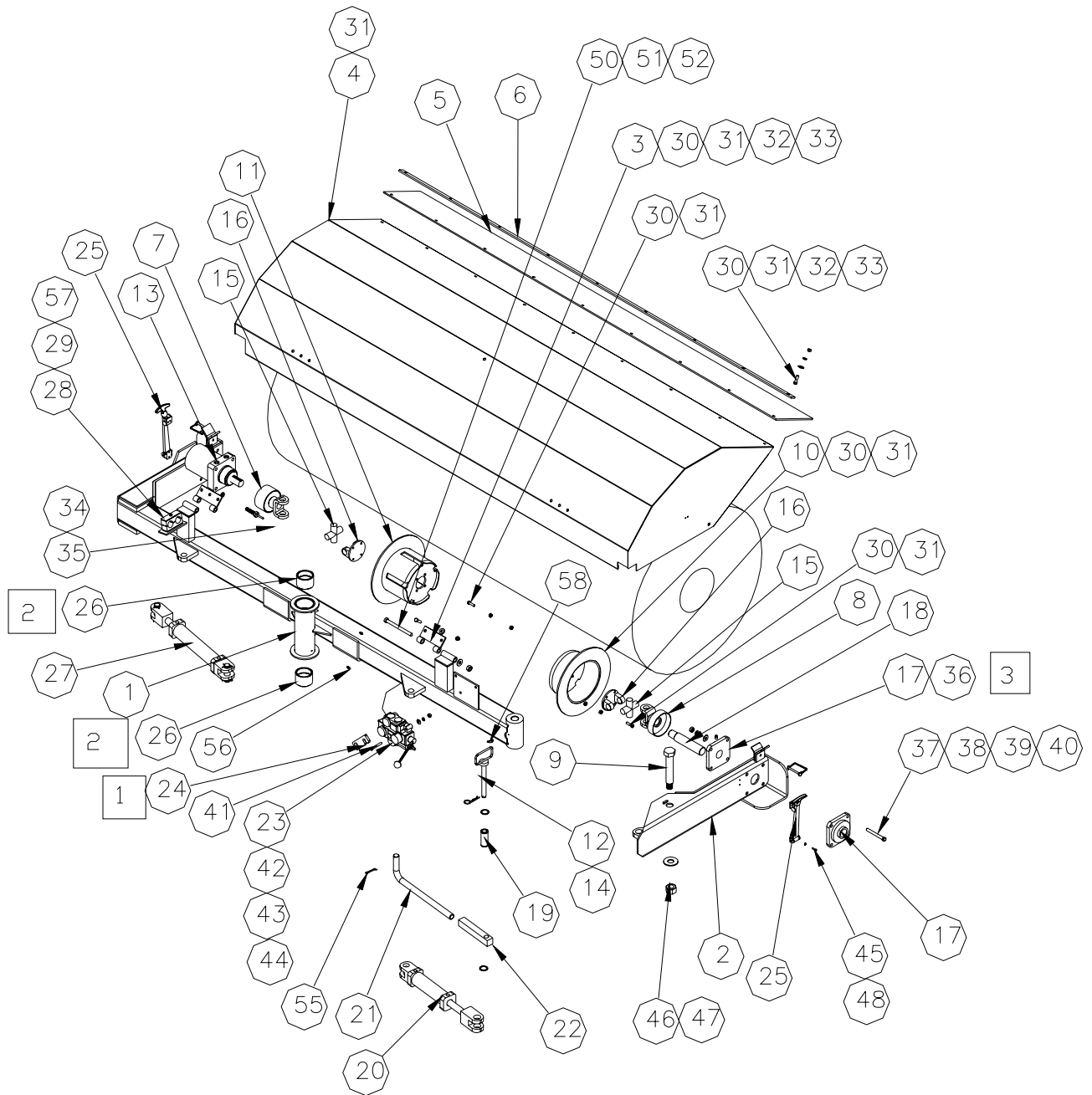
REF: 27458

REV: 0

ITEM	PART NO.	QTY.	DESCRIPTION
1	27459	1.00	BRUSH FRAME,W/M,8FT.
2	26571	1.00	QUICK CHG ARM,W/M
3	26531	2.00	BRUSH HINGE,W/M
4	27460	1.00	BRUSH COVER,W/M,8 FT.
5	27461	1.00	APRON,8 FT.
6	27462	1.00	PLATE,APRON,8 FT.
7	26951	1.00	DRIVE HUB GUARD,W/M
8	26954	1.00	IDLE HUB GUARD,W/M
9	26558	1.00	SWING ARM BOLT
10	26549	1.00	IDLE HUB,W/M
11	26547	1.00	DRIVE HUB,W/M
12	38511	1.00	PIN,HITCH,.750X6.50 GRIP
13	38286	1.00	MOTOR,HYD
14	81237	2.00	RING,RETAINING EXT 1.250 SHAFT
15	38294	2.00	KIT,BEARING CROSS
16	38285	2.00	YOKE,FLANGE
17	38283	2.00	BEARING,4 BOLT,PILLOW,BL,FLNGE
18	26520	1.00	IDLE SHAFT PIN
19	26523	1.00	QUICK CLAMP SLEEVE
20	38546	1.00	CYL,HYD,2.0X6.0
	38546-01		SEAL KIT,HYD CYL,2BX1.12R
21	26557	1.00	QUICK CHANGE BAR
22	26524	1.00	QUICK CHANGE LEVER BOLT
23	38307	1.00	VLV,HYD,SINGLE SPOOL
24	26522	1.00	LATCH BAR
25	38576	2.00	LATCH,T-HANDLE
26	26521	2.00	PIVOT BUSHING,BRUSH FRAME
27	38548	1.00	CYL,HYD,2.0X8.0
	38546-01		SEAL KIT,HYD CYL,2BX1.12R
28	38280	2.00	CLAMP,HALF,HOSE 1.25
29	35541	1.00	CLAMP COVER PLATE
30	80224	23.00	CSHH,.375-16X1.25,GR5
31	80038	31.00	NUT,HEX,.375-16

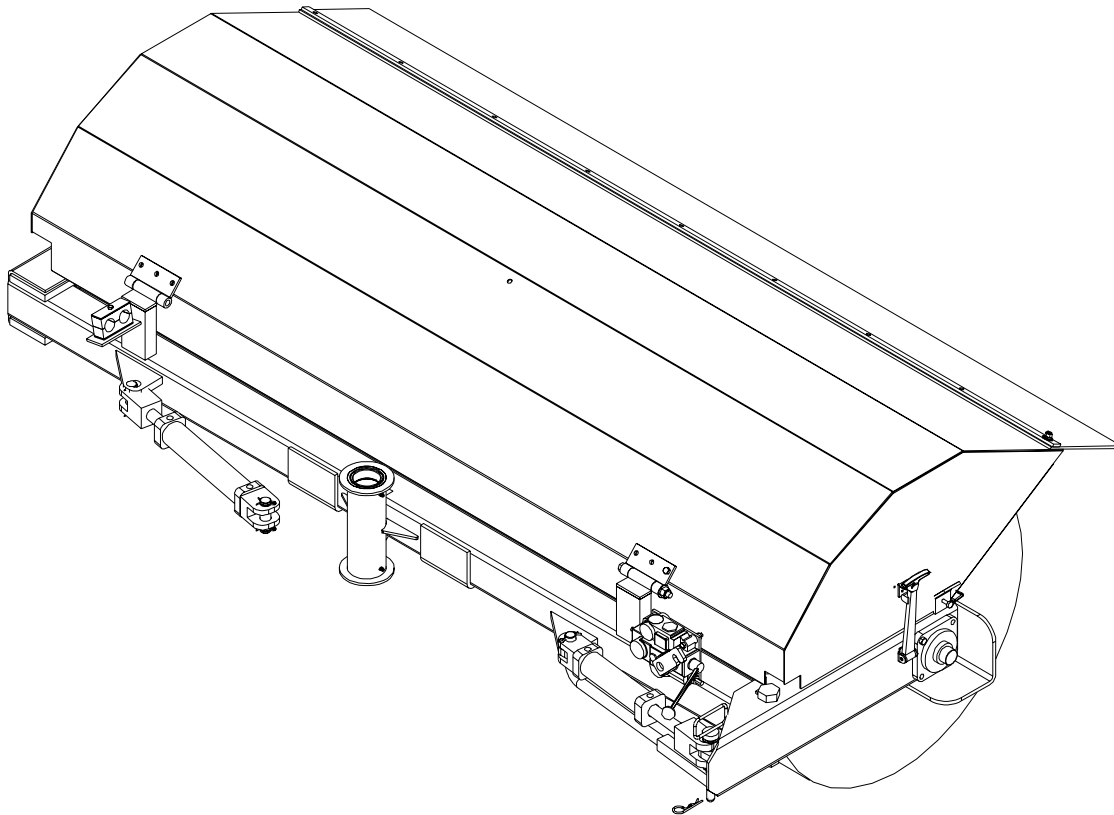


FRONT VIEW
SET UP BEFORE PUTTING ON THE BRUSH

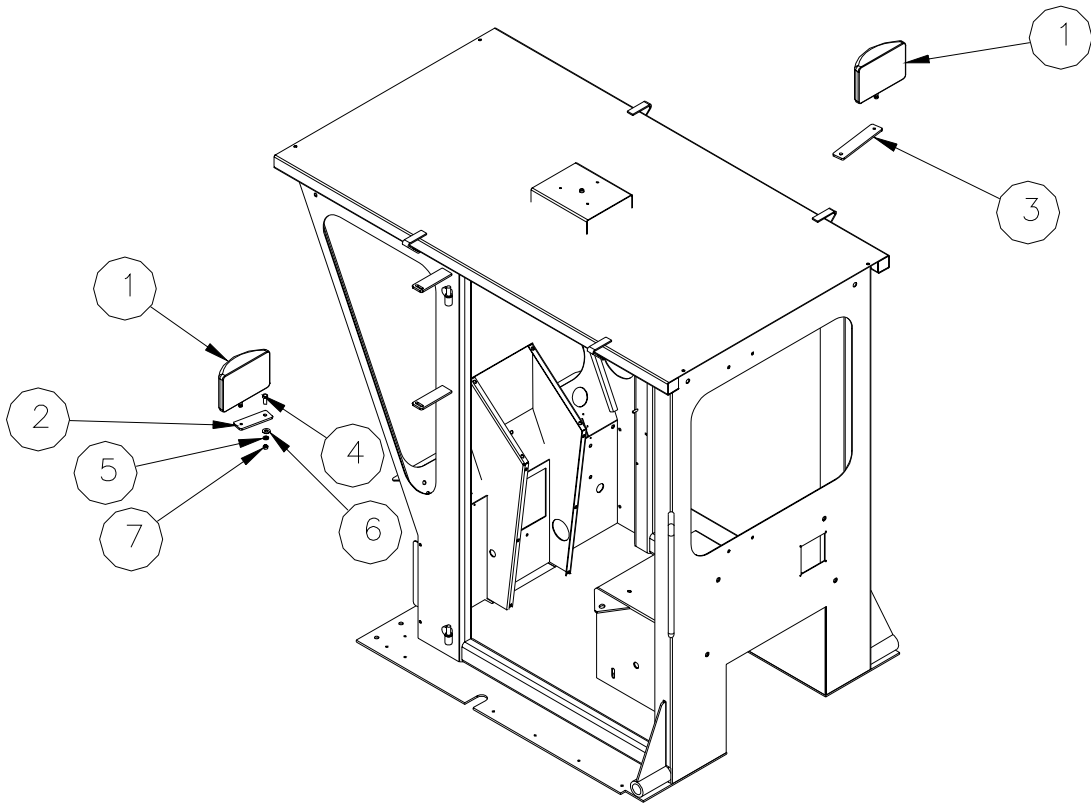


1. ITEM 24 SECURED WITH HYD FITTING TO VALVE.
2. ALIGN HOLES IN BUSHINGS WITH HOLES IN HSG.
3. AFTER LUBING BEARING, REPLACE ZERK WITH PLUG ITEM 36.

ITEM	PART NO.	QTY.	DESCRIPTION
32	80142	15.00	WASHER,TYPE A PLAIN,.375
33	80162	15.00	WASHER,SPLIT LOCK,.375
34	80164	4.00	WASHER,SPLIT LOCK,.500
35	26959	4.00	DRIVE HUB BOLT,MODIFIED
36	99534	1.00	PIPE,PLUG,02MP,SQ HD,MI
37	81124	4.00	CSHH,.438-14X4.00,GR5
38	80143	4.00	WASHER,TYPE A PLAIN,.438
39	80163	4.00	WASHER,SPLIT LOCK,.438
40	80039	4.00	NUT,HEX,.438-14
41	80214	3.00	CSHH,.312-18X2.25,GR5
42	80141	3.00	WASHER,TYPE A PLAIN,.312
43	80161	3.00	WASHER,SPLIT LOCK,.312
44	80037	3.00	NUT,HEX,.312-18
45	71716	8.00	MACH SCR,PH,#10-24X.75
46	80359	1.00	NUT,FLEXLOC,1.000-8,FULL,LT
47	80149	1.00	WASHER,TYPE A PLAIN,1.000
48	871071601	8.00	WASHER,SPLIT LOCK,#10
50	80467	2.00	CSHH,.500-13X6.00,GR5
51	80144	2.00	WASHER,TYPE A PLAIN,.500
52	80354	2.00	NUT,FLEXLOC,.500-13,FULL,LT
55	80336	1.00	COTTER PIN,.188X1.50
56	33684	2.00	FITT,LUBE,STR,02MP,SHORT
57	80197	1.00	CSHH,.250-20X2.25,GR5
58	33683	1.00	FITT,LUBE,45,02MP

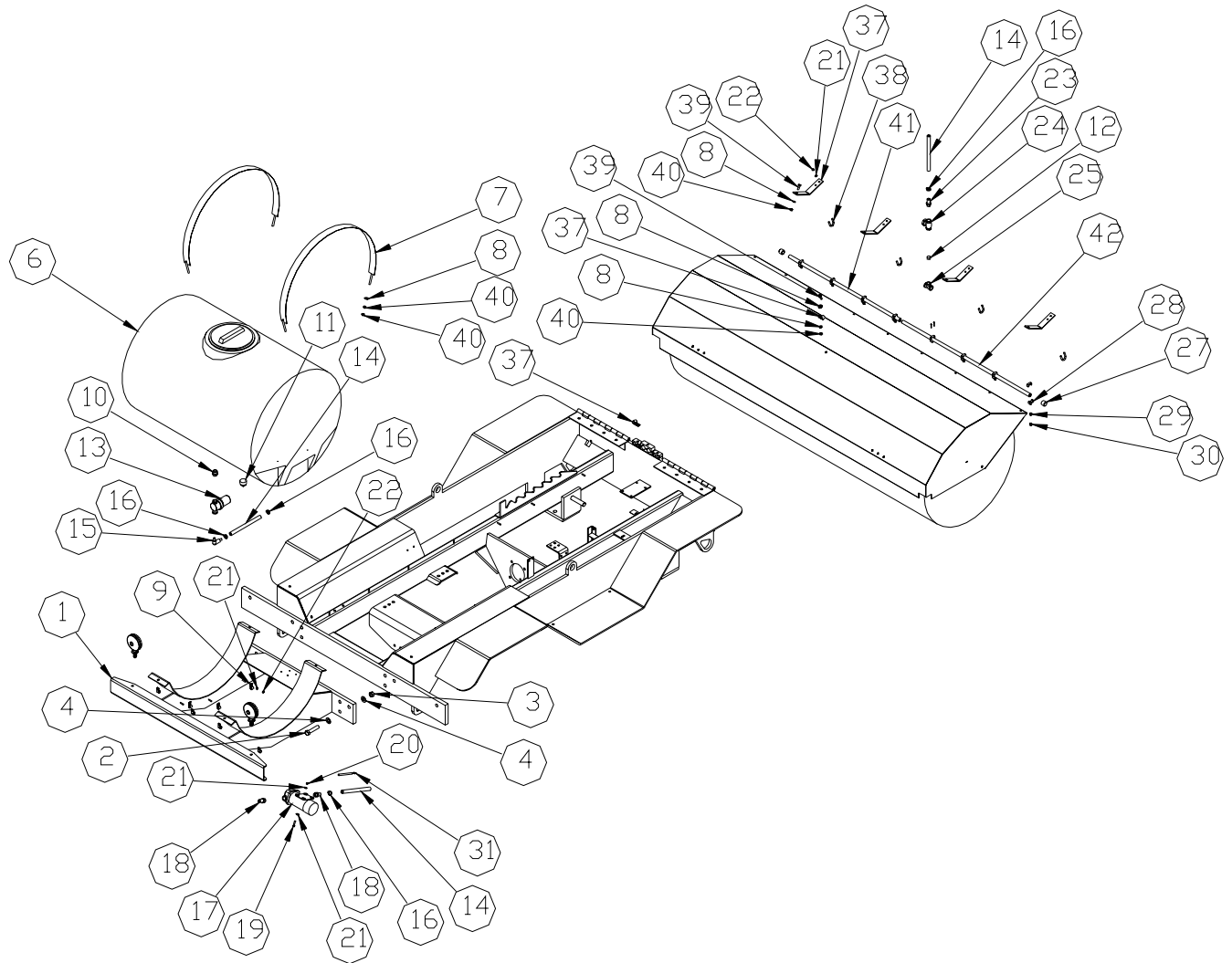


ITEM	PART NO.	QTY.	DESCRIPTION
1	38503	2.00	MIRROR,6X9 SS HEAD
2	26967	1.00	BRACKET,MIRROR,LEFT SIDE
3	26968	1.00	BRACKET,MIRROR,RIGHT SIDE
4	80224	2.00	CSHH,.375-16X1.25,GR5
5	80162	2.00	WASHER,SPLIT LOCK,.375
6	80142	2.00	WASHER,TYPE A PLAIN,.375
7	80038	2.00	NUT,HEX,.375-16



ITEM	PART NO.	QTY.	DESCRIPTION
1	27100	1.00	MOUNT W/M, WATER TANK
2	81027	6.00	CSHH,.750-10X3.50,GR8
3	80043	6.00	NUT,HEX,.750-10
4	81154	12.00	WASHER,SAE,HARDENED,.750
5	27824	1.00	HARNES,LIGHTS,TAIL,EXTENSION
6	33238	1.00	TANK,WATER,150 GAL
6a	33238-01		PIPE,BULKHEAD,1.25 FP,PVC
6b	33238-02		PIPE,BULKHEAD,12FP,PVC
6c	33238-03		COVER,10 INCH,VENTED,RAVEN
7	12488	2.00	TANK STRAP W/M
8	81155	14.00	WASHER,SAE,HARDENED,.375
9	33594-01	7.00	CLAMP,LOOP,.50 OD,REM CUSHION
10	70459	1.00	FITT,STR 08MP-12MP
11	99540	1.00	PIPE,PLUG,1.25MP,SQ HD,MI
13	36926	1.00	STRAINER,LQD,100MESH,NYL,08FP
14	6352	30.00	HOSE,08,PUSH-ON,250
15	70319	1.00	FITT,90 08MP-08HB,POLY
16	33163	6.00	CLAMP,HOSE,.50-.91,WORM,#08
17	36730	1.00	PUMP,WATER,W/PRESSURE SWITCH
18	36809	1.00	PORT KIT,08 BARB X 90,EPDM
19	80187	4.00	CSHH,.250-20X1.25,GR5
20	80350	4.00	NUT,FLEXLOC,.250-20,FULL,LT
21	80140	8.00	WASHER,TYPE A PLAIN,.250
22	80036	16.00	NUT,HEX,.250-20
23	X427	1.00	FITT,STR 08MP-08HB,CRIMPED
24	36883	1.00	VLV,CHECK 08HB,POLY (5PSI)
25	99845	1.00	PIPE,TEE,08FP,GALV
27	91152	2.00	PIPE,CAP,08FP,GALV
28	38655	8.00	NOZZLE,EYELET,08 PIPE,NYLON
29	38657	8.00	NOZZLE,80 DEG,.094 ORF,NYLON
30	38656	8.00	NOZZLE,CAP,BLACK,NYLON,W/SEAL
31	25835	1.00	WIRE HARNES,WATER PUMP
35	36341	1.00	FUSE,BLADE,15AMP,ATC-15
36	871111602	2.00	CLAMP,LOOP,.75 OD,PLSTC COVER
37	26484	4.00	BRACKET,SPRAY PIPE
38	35077	4.00	U-BOLT,.250-20,1.00IW,1.75IL
39	80224	10.00	CSHH,.375-16X1.25,GR5
40	80038	4.00	NUT,HEX,.375-16
41	21144	1.00	SPRAY PIPE,LH
42	21143	1.00	SPRAY PIPE,RH

NOT SHOWN, 5,32-36,22



NOTES:

1. HOLES IN SPRAY PIPE, ITEM 41 AND 42, SHOULD BE FACING DOWN.
2. SLOT OF SPRAY NOZZLE, ITEM 29, MUST BE PARALLEL WITH SPRAY PIPE.
3. ITEMS 32, 33, 34, & 35 TO BE USED IN CONTROL PANEL CONSOLE.
4. INSTALL CHECK VALVE, ITEM 24, SO THAT WATER FLOW IS IN DIRECTION OF ARROW ON VALVE.
5. TAIL LIGHTS MOUNT ON MOUNT, W/M WATER TANK

ITEM	PART NO.	QTY.	DESCRIPTION
	26306	REV. G	WIRING ASSEMBLY
.....	28600	1.00	LIGHTING GROUP,CHAL2 2002 (See Detail)
.....	27847	1.00	WIRE,EXT,NEUTRAL SAFETY SWITCH
.....	26446	1.00	BATTERY ASSY (See Detail Next Page)
.....	26447	1.00	WIRING HARNESS
.....	26330	1.00	INSTRUMENTS,STANDARD (See Detail Pg.30)
.....	26958	1.00	WIRING SCHEMATIC,CHAL2 (See Schematics)
.....	27152	1.00	WIRE,JUMPER,GROUND
.....	27153	1.00	HARNESS,STARTER-SOLENOID
.....	33595	4.00	CLAMP,LOOP,1.00 OD,REM CUSHION
.....	871111605	4.00	CLAMP,LOOP,.50 OD PLSTC COVER
.....	80140	8.00	WASHER,TYPE A PLAIN,.250
.....	80160	8.00	WASHER,SPLIT LOCK,.250
.....	80036	8.00	NUT,HEX,.250-20
	26325	REV. B	WHEEL ASSEMBLY,8.75-16.5/D LT
.....	38370	1.00	WHEEL,16.5X6.75,8 HOLE
.....	38371	1.00	TIRE,8.75-16.5/D LT
.....	34792	1.00	TIRE VALVE,TUBELESS,.625,1.25
	26326	REV. B	WINDSHIELD WIPER ASSEMBLY
.....	36741	1.00	WIPER MOTOR,2-SPEED
.....	33744-01	1.00	BLADE,WIPER
.....	33744	1.00	ARM,WIPER
.....	36742	1.00	SWITCH,WIPER/WASHER
.....	36340	1.00	FUSE,BLADE,10AMP,ATC-10
.....	80192	1.00	CSHH,.250-20X.75,GR5
.....	80036	1.00	NUT,HEX,.250-20
.....	80140	1.00	WASHER,TYPE A PLAIN,.250
.....	72997	3.00	TERM,PUSH-ON,.25,FEM,16-14G,90
.....	53489	1.00	SPACER,CLUTCH BRACE
	26327	REV. D	WINDSHIELD WASHER ASSEMBLY
.....	38509	1.00	WASHER,TANK AND PUMP
.....	35465-07	1.00	GROMMET,INSULATION,.750 ID
.....	36753	1.00	WASHER NOZZLE & TEE KIT
.....	35213	2.00	HOLDER,WIRE TIE,ADHESIVE BACK
.....	80140	3.00	WASHER,TYPE A PLAIN,.250
.....	80036	3.00	NUT,HEX,.250-20
.....	80160	3.00	WASHER,SPLIT LOCK,.250
.....	35550	16.00	HOSE,WINDSHIELD WASHER .188ID
	26322	REV. B	WEST COAST MIRRORS
.....	38057	1.00	MIRROR,WEST COAST,7X16 (PR)
.....	80351	4.00	NUT,FLEXLOC,.312-18,FULL,LT
.....	80208	4.00	CSHH,.312-18X1.00,GR5
.....	80141	8.00	WASHER,TYPE A PLAIN,.312

ITEM	PART NO.	QTY.	DESCRIPTION
	28600	REV. 0	LIGHTING ASSEMBLY
0	35465-06	2.00	GROMMET,INSULATION,.375ID
0	36348	2.00	TERM,PUSH-ON,.25,M,18-14,SLV
0	36349	2.00	TERM,PUSH-ON,.25,FEM,18-14,SLV
0	38464	1.00	DECAL,FRESH AIR/WORK LIGHTS
0	38840	1.00	LIGHT,DOME
0	6322	1.00	SWITCH,PUSH-PULL,ON/OFF,12V
0	72318	4.00	LAMP,HALOGEN,FLOOD,80X30 DEG
2	6161	2.00	LIGHT,TURN SIGNAL,AMBER
3	851342007	2.00	LIGHT,TURN/BRAKE,RED
4	35139	2.00	CONNECTOR,SEALED,TOWER,2-PIN
5	36165	4.00	TERM,SEALED CONN,16-14 GA,FEM
6	36166	4.00	SEAL,CABLE,18-16 GA
7	81155	2.00	WASHER,SAE,HARDENED,.375
	38687	REV. 0	AMBER STROBE LIGHT
1	38687-01	1.00	LIGHT,STROBE,FLASH TUBE
2	38687-02	1.00	LENS,AMBER,3400 SERIES
3	38687-03	1.00	O-RING,STROBE LIGHT,3400SERIES
4	38687-04	1.00	GASKET,STROBE LIGHT,3400SERIES
	26446	REV. B	BATTERY ASSEMBLY
	33146-6	1.00	BATTERY,12V,950CRK AMPS
	72313	1.00	HOLD DOWN,BATTERY
	36018	1.00	CABLE,BATTERY,NEG,14X0GA
	36338	1.00	CABLE,BATTERY,POS,2-LUG,X0GAX17
	36339	1.00	CABLE,BATTERY,2 LUG,X0GAX17
	70437	1.00	BATTERY BOOT,POS (RED)
	80393	2.00	CSHH,.375-16X9.50,GR5
	80142	2.00	WASHER,TYPE A PLAIN,.375
	80162	2.00	WASHER,SPLIT LOCK,.375
	80038	2.00	NUT,HEX,.375-16
	871111605	1.00	CLAMP,LOOP,.50 OD PLST COVER
	26320	REV. A	DEFROST FAN ASSEMBLY
	38391	1.00	DEFROST FAN
	26456	1.00	BRKT,DEFROST FAN
	80324	2.00	SCR,SLFTPG,HH,.250-20X.75
	871041003	4.00	MACH SCR,FH,#10-24X1.00
	80494	4.00	NUT,HEX,#10-32
	871071601	4.00	WASHER,SPLIT LOCK,#10
	33271-18	5.00	WIRE,16 GA,BLUE/RED STRIPE
	33600	1.00	TERM,PUSH-ON,.25,FEM,16-14 GA

BUMPER WEIGHT

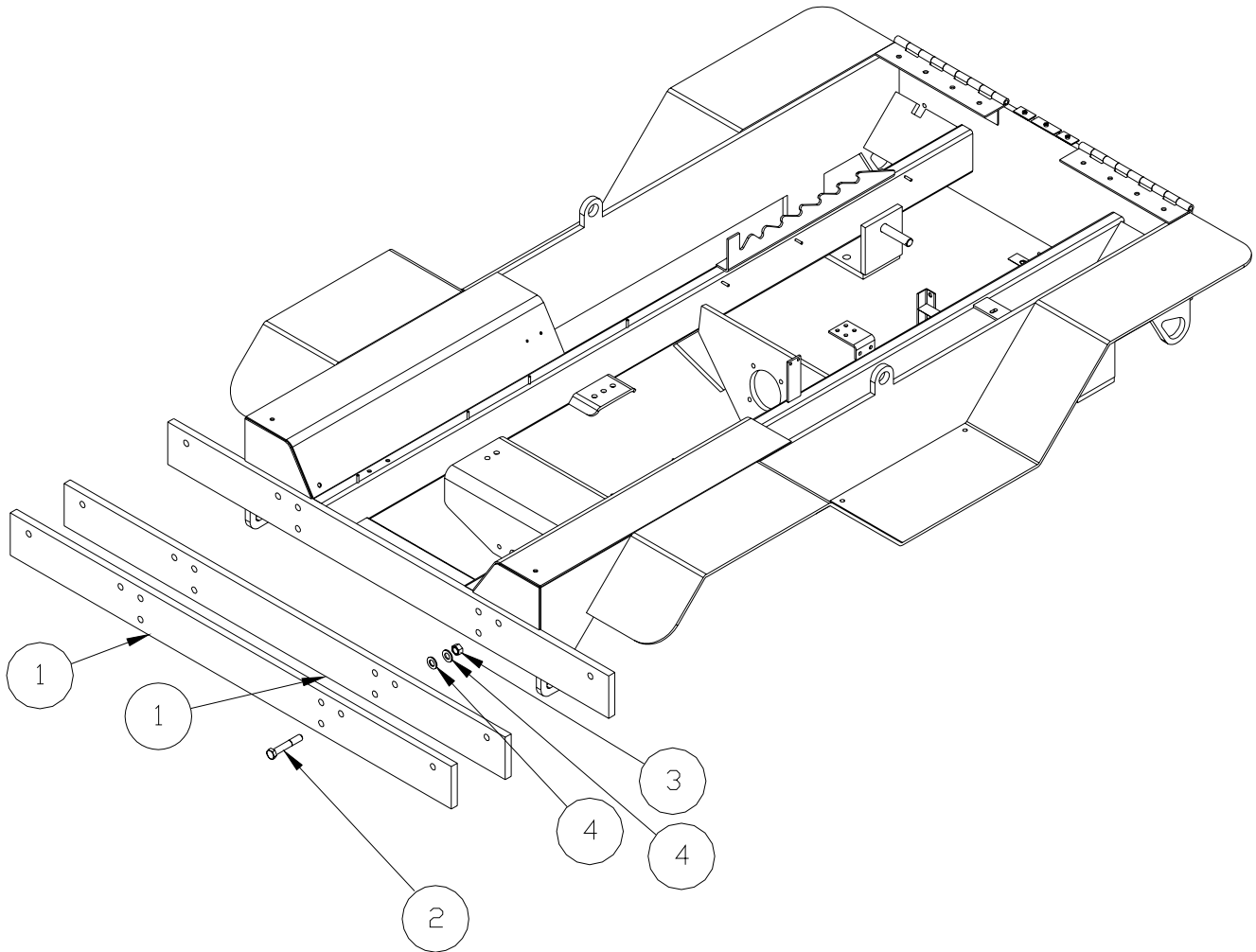
OPTIONAL EQUIPMENT

Challenger II

REF: 27716
REV: 0

ITEM	PART NO.	QTY.	DESCRIPTION
1	27141	2.00	BUMPER,REAR,CHAL2
2	8102	6.00	CSHH,.750-10X3.50,GR8
3	80043	6.00	NUT,HEX,.750-10
4	81154	12.00	WASHER,SAE,HARDENED,.750

**** USED WITHOUT WATER SPRAY ASSEMBLY ****



Challenger II

REF: 26969

REV: 0

NON-ILLUSTRATED GROUPS

OPTIONAL EQUIPMENT

ITEM	PART NO.	QTY.	DESCRIPTION
	38334-01	REV. A1	BRUSH,7',POLY
	38334-02	REV. O	BRUSH,7',POLY/STL
	38631-02	REV. O	BRUSH,8',POLY/STL
	26323	REV. Ø	AMBER ROTATING BEACON
	26893	REV. Ø	INSIDE REAR VIEW MIRROR GROUP
.....	35417	1.00	MIRROR,7.00X10.00 RECT
.....	26918	1.00	BRACKET,MIRROR
.....	80192	1.00	CSHH,.250-20X.75,GR5
.....	80160	2.00	WASHER,SPLIT LOCK,.250

NON-ILLUSTRATED GROUPS

Challenger II

REF: SEE LISTS
REV:

OPTIONAL EQUIPMENT

ITEM	PART NO.	QTY.	DESCRIPTION
	27909	REV. O	ENGINE SHUTDOWN GROUP
.....	36085	1.00	RELAY,SPDT,40AMP,12VDC
.....	36086	1.00	BRACKET,RELAY MOUNT
.....	36118-2	4.00	TERM,CRIMP,16-14 GA
.....	36150	1.00	ALARM,BUZZ/LIGHT,RED
.....	36343	1.00	SWITCH,TEMP,210 DEG F,08 MP
.....	36393	1.00	SWITCH,PUSH BTN,OFF-MOM ON
.....	38725	1.00	SWITCH,PRESSURE,15 PSI
.....	90768	1.00	PIPE,CPLG,02FP,300#
.....	99610	1.00	PIPE,NIPPLE,02XCLOSE
.....	851390204	8.00	TERM,RING,16-14 GA,#10 STUD
.....	33271-2	2.00	WIRE,16 GA,YELLOW
.....	33271-13	3.00	WIRE,16 GA,BLACK/YELLOW STRIPE
.....	33271-4	4.00	WIRE,16 GA,GREEN
.....	33271-12	2.00	WIRE,16 GA,RED/BLACK STRIPE
.....	37426	1.00	TERM,PUSH-ON,JUMPER,.25,16-14G
.....	35926	1.00	TERM,PUSH-ON,.25,FEM,22-18 GA
.....	36165	1.00	TERM,SEALED CONN,16-14 GA,FEM
.....	36166	2.00	SEAL,CABLE,18-16 GA
.....	36201	1.00	DECAL SET,OPTIONAL EQUIPMENT
	27819	REV. O	ENGINE ALARM GROUP
.....	36150	1.00	ALARM,BUZZ/LIGHT,RED
.....	851390204	3.00	TERM,RING,16-14 GA,#10 STUD
.....	33271-4	2.00	WIRE,16 GA,GREEN
.....	33271-11	2.00	WIRE,16 GA,BLUE
.....	36165	1.00	TERM,SEALED CONN,16-14 GA,FEM
.....	36166	1.00	SEAL,CABLE,18-16 GA
.....	35371	1.00	SWITCH,TEMP,205 DEG,06MP
.....	99450	1.00	PIPE,BUSH,08MP-06FP,MI
	27897	REV. O	GAUGE GROUP, HYD. OIL TEMP.
.....	33271-21	1.50	WIRE,16 GA,ORANGE/YEL STRIPE
.....	33620	1.00	TERM,RING,12-10 GA,#10 STUD
.....	35365	1.00	GAUGE,TEMP,OIL
.....	35368	1.00	SENDER,TEMP GAUGE,04 MP
.....	36165	1.00	TERM,SEALED CONN,16-14 GA,FEM
.....	36166	1.00	SEAL,CABLE,18-16 GA
.....	72143	1.00	TERM,RING,22-16 GA,#8 STUD

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