

# Operator's Safety and Service Manual

## Hydraulic Mortar & Plaster Mixer



HM12 / HM16



It is the OWNER'S RESPONSIBILITY to communicate information on the  
SAFE USE and OPERATION of this machine to the operators.

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# 1. SERIAL NUMBER LOCATION

The model/serial number decal is located on the shroud assembly (black).

(Write model number)



(Write serial number)

The unit's year of manufacture can be determined by the serial number. Contact your nearest sales branch or  for more information.


This Unit warranty is stated in this Operational and Safety manual on page 16. Failure to return warranty registration card renders the warranty null and void.


An engine owner's manual is also attached to every unit. Engine parts may order from any authorized dealer. Refer to the engine owner's manual to learn about specifications and part identification.

## 2. PARTS ORDERING PROCEDURE:

 Parts are available worldwide and must be ordered through your local distributor. If you can't locate the  distributor in your area refer to page 17 of this manual to locate the nearest branch and contact numbers for assistance.


### ALWAYS HAVE READY:

1. Model and serial number of machine when ordering  parts.
2. Model and serial number of engine when ordering engine parts.
3. Item part number(S), description, and quantity.
4. Company name, address, zip code, and purchase order number.
5. Preferred method of shipping.

**REMEMBER – you own the best. If repairs are needed use only purchased parts from authorized  distributors.**

## 3. OPERATING INSTRUCTIONS

### INTRODUCCION

 Mixers are intended for use in several applications. They are powered by four cycle gas engines or electric motors and are available in different sizes and manufacturers.

This Operation manual contains only standard parts. Variations of these parts as well as other special parts are not included. Contact your local  distributor for assistance in identifying parts not included in this manual.

### ASSEMBLY INSTRUCTIONS

1. Remove the mixer and all components from its shipping crate. You will see:
  - Two rim and tire assemblies.
  - Axle assembly with hubs on each side, idler spring, and 8 lug nuts.
  - Selected hitch with lock pin and bolt and safety bolt with hair pin.

**Note: All installation hardware must be inserted into its respective location on the mixer, see parts explosion for more details.**

2. After removing all mixers' safety packing, while standing on an end, locate the axle's place on the mixer. You need to locate the bolts attached to the mixer shroud, bolted to the pallet and make sure this bolts are removed.
3. Lift the axle up to the mixer frame and position it with the bracket spring lined up to the idler clutch hole on the mixer's frame.
4. Insert two 1/2 inch bolts with a washer through the frame and the vertical mounting bracket on the axle. Secure each bolt with a washer and locknut. Tight the bolts at 57 ft.-lbs.
5. Remove the lug nuts from the axle and mount the speed wheel, after wheel is mounted proceed to place the lug nuts (make sure the conical (tapered) end is facing the inside of the wheel. Torque to 105 ft.-lbs.
6. Proceed with the second wheel using the steps of point #3.
7. Hook one end of the spring to the idler arm. Hook the other end of the spring to the spring plate on the axle. The spring should be hooked through the second hole from the top toward the middle of the mixer.
8. Using appropriated Equipment, put the mixer down to the ground.



**Warning: failure to use proper lifting equipment could cause mixer to fall and cause serious injury.**

9. Position the safety chain through the key slots in the front leg. Adjust the chain's ends to equal length.
10. Remove the safety bolt and pin from the tow bar.
11. Install the tow bar through the front leg.
12. Insert the pin through the front leg and the front hole in the tow bar. Secure the pin with a hairpin cotter.
13. Insert the 3/4" bolt through the rear hole and secure with a lock washer and nut. Tighten securely.



## 4. SAFETY PRECAUTIONS



**READ AND STUDY THE FOLLOWING SAFETY INFORMATION BEFORE ATTEMPTING TO OPERATE THIS EQUIPMENT. IN ADDITION, ENSURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.**

### **WARNING - LETHAL EXHAUST GAS!**

An internal combustion engine discharges carbon monoxide, which is a poisonous and odorless invisible gas. Death or serious illness may result if inhaled. Operate only in an area with good ventilation, **NEVER IN A CONFINED AREA!**

### **WARNING - DANGEROUS FUELS!**

Use extreme caution when storing, handling and using fuels - they are highly volatile and explosive in the vapor state. Do not add fuel while engine is running. Stop and cool the engine before adding fuel.

### **DO NOT SMOKE WHEN REFUELING!**

### **SAFETY GUARDS**

It is the owner's responsibility to ensure **ALL GUARDS AND SHIELDS** are in place and in working order.

### **IGNITION SYSTEMS**

Breakerless magneto and batteries ignition systems **CAN CAUSE SEVERE ELECTRICAL SHOCKS**, avoid contact with these components or their wiring.

### **SAFE DRESS**

**DO NOT WEAR** loose clothing, rings, wristwatches, etc., near machinery.

### **NOISE PROTECTION**

Wear O.S.H.A. specified hearing protection devices.

### **FOOT PROTECTION**

Wear O.S.H.A. specified steel tip safety shoes.

### **HEAD PROTECTION**

Wear O.S.H.A. specified safety helmets.

### **EYE PROTECTION**

Wear O.S.H.A. specified eyes shields, safety glasses, and sweat bands.

### **DUST PROTECTION**

Wear O.S.H.A. specified dust mask or respirator.

### **OPERATOR**

Keep children and bystanders off and away from the equipment.

## OPERATOR

For details on safety rules and regulations in the United States, contact your local Occupational Safety and Health Administration (O.S.H.A.) office. Equipment operated in other countries must be operated and serviced in accordance and compliance with any and all safety requirements of such country. The publication of these safety precautions is done for your information does not by the publication of these precautions, imply or in any way represent that these are the sum of all dangers present near equipment. If you are operating a unit it is your responsibility to insure that such operation is in full accordance with all applicable safety requirements and codes. All requirements of the United States Federal Occupational Safety and Health Administration Act must be met when operated in areas that are under the jurisdiction of that United States Department.

## 5. SAFETY NOTICE & DECALS



### IMPORTANT NOTICE



The "SAFETY ALERT SYMBOL" is used to call attention to items or operations that may be dangerous to those operating or working with this equipment. These symbols can be found throughout the manual and on the unit itself. Please read these warnings and cautions carefully.

## READ SAFETY DECALS CAREFULLY

Carefully read and follow all safety decals. Keep them in good conditions. If they become aged, replace as required. If repainting, **REPLACE ALL** decals. Decals are available from your authorized Distributors. Decals are not shown to scale.



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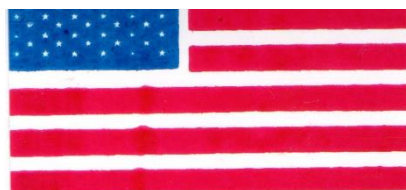
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201157



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**⚠ WARNING**

73  
km/hr

Excessive towing speed can cause serious injury or death.  
Do NOT exceed 45mph (73km/hr)

\* Make certain that the wheel lug nuts and axle mounting hardware are tight.

\* Check pressure and overall condition of tires.

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Carefully read and follow all safety decals. Keep them in good condition. If they become aged, replace as required. If repainting, **REPLACE ALL** decals. Decals are available from your authorized Distributors. Decals are not shown to scale.

**⚠ WARNING**

**ROTATING PART HAZARD  
KEEP AWAY**

To prevent serious injury or death rotating parts:

1. Install, close and secure all guards, shields and hoods before operating.
2. Do not place hands in drum unless the motor or engine is off and the power cord unplugged or the spark plug wire is disconnected
3. Keep hands, feet, hair and clothing away from moving parts.

201003

201003 (x2)

**⚠ WARNING**

201005

**USE  
GASOLINE  
FUEL ONLY**

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201152

**EMERGENCY  
STOP  
PUSH TO STOP**

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201026

**⚠ DANGER**

**FIRE HAZARD  
NO SMOKING**

To prevent serious injury or death from fire:  
Do not smoke when refueling.  
Keep sparks, flames, and hot material away from flammable substances.

201005

201005

201006

**⚠ DANGER**

**ELECTROCUTION HAZARD**

1. Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing or repairing machine or electrical components
2. Keep electrical components in good repair.

201006



### CHECK LIST

- 1 Check and tighten where necessary - all nuts and bolts.
- 2 Check mixer paddle adjustments and tighten paddle bolts.
- 3 Grease all fittings - grease drum seals forcing grease out under the seal lip.
- 4 Check belt adjustment and tighten belt if necessary.
- 5 Check tire pressure - inflate 12" and 15" tires to 30 psi. 8" tires to 45 psi.
- 6 Ensure that drum lock and hood fastener are in the locked position before transporting.

TO AVOID DOWNTIME ON REPAIRS CHECK PERIODICALLY WHEN IN USE

290781

**290791**

**WARNING**

Improper operation of this equipment can cause serious injury or death.

Read Operator's Manual supplied with this machine before operation or servicing.

Modification or alteration of this machine can cause written consent the manufacturer.

Do not alter or modify this machine without the express written consent of the manufacturer.

201154

**201154**

**WARNING**

- 1 Read and understand Operators Manual and safety signs before starting.
- 2 A Stop engine, disconnect spark plug wire and wait for all moving parts to stop before servicing, maintaining, adjusting or cleaning.
- 2 B Turn motor off, unplug power cord or turn off power at master panel and wait for all moving parts top stop before servicing, maintaining, adjusting, or cleaning.
- 3 Keep hands, feet, hair and clothing away from moving parts.
- 4 Install, close and secure all guards, shields and hoods before operating.
- 5A Do not place hands in the drum unless engine OFF and spark plug wire is disconnected.
- 5B Do not place hands in the drum unless motor is OFF and power cord is unplugged.
- 6A Stay away from hot engine components during operation.
- 6B Have licenced electrician wire up provide power to the electric motor.
- 7A Do not smoke when refueling.
- 7B Use a power cord with the required capacity to carry the power to the motor.
- 8A Follow good safety procedures when handling fuel.
- 8B Route the power cord out of the way or protect it from damage.
- 9 Do not operate in an explosive atmosphere or a poorly ventilated area without adequate ventilation.
- 10 Keep working area dry and clean to prevent slipping and tripping.
- 11 Always attach safety chain when towing.
- 12 Comply with applicable transporting regulations when towing.
- 13 Do not allow riders during transporting.
- 14 Do not exceed a safe travel speed when transporting. Slow down for corners and when going over rough terrain.

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**201001 SMALL**

**WARNING**

**MISSING GUARD HAZARD**

Install, close and secure all guards, shields and hoods before operating.

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**201004**

**WARNING**

- 1 Read and understand Operators Manual and safety signs before starting.
- 2 A Stop engine, disconnect spark plug wire and wait for all moving parts to stop before servicing, maintaining, adjusting or cleaning.
- 2 B Turn motor off, unplug power cord or turn off power at master panel and wait for all moving parts top stop before servicing, maintaining, adjusting, or cleaning.
- 3 Keep hands, feet, hair and clothing away from moving parts.
- 4 Install, close and secure all guards, shields and hoods before operating.
- 5A Do not place hands in the drum unless engine OFF and spark plug wire is disconnected.
- 5B Do not place hands in the drum unless motor is OFF and power cord is unplugged.
- 6A Stay away from hot engine components during operation.
- 6B Have licenced electrician wire up provide power to the electric motor.
- 7A Do not smoke when refueling.
- 7B Use a power cord with the required capacity to carry the power to the motor.
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- 10 Keep working area dry and clean to prevent slipping and tripping.
- 11 Always attach safety chain when towing.
- 12 Comply with applicable transporting regulations when towing.
- 13 Do not allow riders during transporting.
- 14 Do not exceed a safe travel speed when transporting. Slow down for corners and when going over rough terrain.

201001

**201001 BIG**

## 6. SAFETY DECAL LOCATION





**WARNING**

- Read and understand Operators Manual and safety tags before starting.
- Always disconnect spark plug wire and wait for 5 minutes, adjusting or cleaning or run off power.
- Turn motor off, unplug power cord or turn off power.
- Never place and use of moving parts, hot surfaces, moving, maintaining, adjusting, or cleaning.
- Keep hands, feet, hair and clothing away from moving parts.
- Install, close and secure all guards, shields and hoods before operating.
- Do not clean hands in the drum unless motor is OFF and spark plug wire is disconnected.
- Do not clean hands in the drum unless motor is OFF and power cord is unplugged.
- Stay away from hot engine components during operation.
- Have licensed electrician wire up provide cover to the electric panel.
- Use a power cord with the required capacity to carry the power to the motor.
- Follow good safety procedures when handling fuel.
- Route the power cord out of the way or protect it from damage.
- Do not operate in an explosive atmosphere or a poorly ventilated area without adequate ventilation.
- Never place and use of moving parts, hot surfaces, moving, maintaining, adjusting, or cleaning.
- Keep working area dry and clean to prevent slipping and tripping.
- Comply with applicable transporting regulations when towing.
- Do not allow others during transporting.
- Do not exceed a safe travel speed when transporting. Slow down for corners and when going over "hump" terrain.

201001 BIG



**WARNING**

**ROTATING PART HAZARD  
KEEP AWAY**

To prevent serious injury or death rotating parts:

- Install, close and secure all guards, shields and hoods before operating.
- Do not place hands in drum unless the motor or engine is off and the power cord unplugged or the spark plug wire is disconnected.
- Keep hands, feet, hair and clothing away from moving parts.

## 6. SAFETY DECAL LOCATION

**WARNING**

Improper operation of this equipment can cause serious injury or death.

Read Operator's Manual supplied with this machine before operation or servicing.

Modification or alteration of this machine can cause written consent the manufacturer.

Do not alter or modify this machine without the express written consent of the manufacturer.

**CHECK LIST**

- Check and tighten where necessary - all nuts and bolts.
- Check mixer paddle adjustments and tighten paddle bolts.
- Grease all fittings - grease drum seals forcing grease out under the seal lip.
- Check belt adjustment and tighten belt if necessary.
- Check tire pressure - inflate 12" and 15" tires to 30 psi, 37 tires to 45 psi.
- Ensure that drum lock and hood fastener are in the locked position before transporting.

TO AVOID DOWNTIME ON REPAIRS CHECK PERIODICALLY WHEN IN USE

**USE GASOLINE FUEL ONLY**

201152

**WARNING**

- Read and understand Operators Manual and safety tags before starting.
- Always disconnect spark plug wire and wait for 5 minutes, adjusting or cleaning or run off power.
- Turn motor off, unplug power cord or turn off power.
- Never place and use of moving parts, hot surfaces, moving, maintaining, adjusting, or cleaning.
- Keep hands, feet, hair and clothing away from moving parts.
- Install, close and secure all guards, shields and hoods before operating.
- Do not clean hands in the drum unless motor is OFF and spark plug wire is disconnected.
- Do not clean hands in the drum unless motor is OFF and power cord is unplugged.
- Stay away from hot engine components during operation.
- Have licensed electrician wire up provide cover to the electric panel.
- Do not smoke when refueling.
- Use a power cord with the required capacity to carry the power to the motor.
- Follow good safety procedures when handling fuel.
- Route the power cord out of the way or protect it from damage.
- Do not operate in an explosive atmosphere or a poorly ventilated area without adequate ventilation.
- Never place and use of moving parts, hot surfaces, moving, maintaining, adjusting, or cleaning.
- Keep working area dry and clean to prevent slipping and tripping.
- Comply with applicable transporting regulations when towing.
- Do not allow others during transporting.
- Do not exceed a safe travel speed when transporting. Slow down for corners and when going over "hump" terrain.

201001 SMALL

When is electric

**DANGER**

**ELECTROCUTION HAZARD**

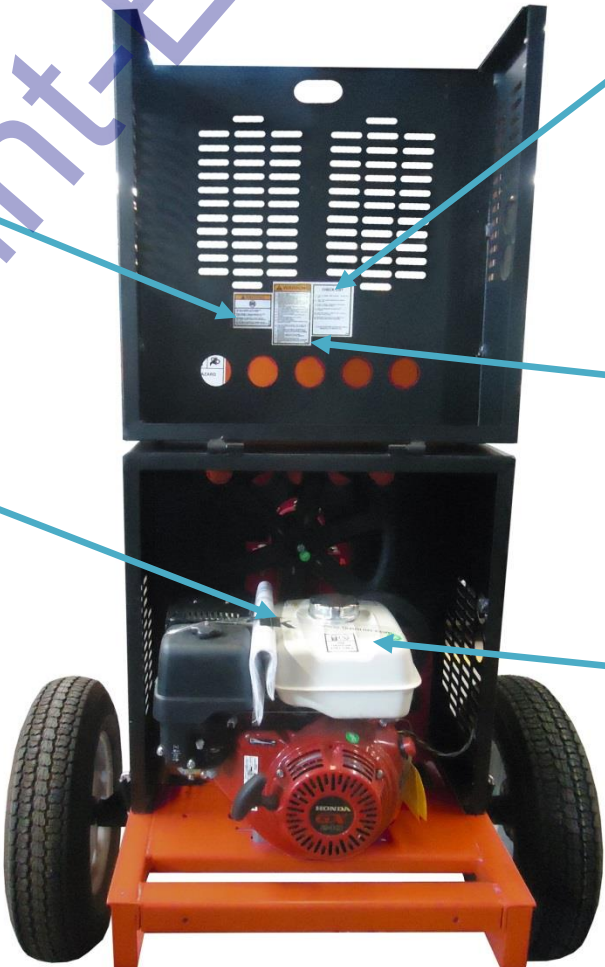
- Turn machine OFF, shut down and lock out power source, unplug power cord and wait for all moving parts to stop before servicing or repairing machine or electrical components.
- Keep electrical components in good repair.

201001

**DANGER**

**FIRE HAZARD  
NO SMOKING**


Do not smoke, use of open flame, or use of any heat source near fuel tank or fuel lines. Do not use flammable substances.





## 7. BEFORE OPERATING

- ✚ **REMEMBER!** It is the owner's responsibility to communicate information on the safe use and proper operation of this unit to the operators.
- ✚ Before operating, review SAFETY PRECAUTIONS listed on page 5 of this manual.
- ✚ Familiarize yourself with the operation of the unit and confirm that all controls function properly BEFORE starting engine.
- ✚ Locate the killing switch and assure you know how to STOP the unit.
- ✚ Make sure hands, feet, and clothing are at a safe distance from any moveable parts prior to starting.
- ✚ Shrouds and grids are provided to protect the operator or structures in close proximity to rotating hot engine parts. It is the **RESPONSABILITY OF THE OPERATOR** to see that they are properly in place.
- ✚ **OIL LEVEL** - Check the oil level in the engine. For more information see "Lubrication" under the engine "Owner's Manual" the "Maintenance" section of this manual. All mixers come without oil running an engine without lubrication may damage the engine.
- ✚ **AIR CLEANER** - Check to ensure elements are in good condition and properly installed.

- + Review every decal with the OPERATOR.
- + FUEL SUPPLY - Engines on  Mixer equipment require an automotive grade of clean, fresh, unleaded or regular gasoline. **All mixers come without gasoline and oil.**
- + FUEL FILTER - Check to ensure element is in good condition... Replace if it is clogged or damaged.
- + LUBRICATION POINTS - Make sure all pillow blocks and drum's trunnions have been properly greased.
- + PADDLES AND BLADES - Check the paddles and make sure they are adjusted to about 1/16" interference. This is mandatory after installing rubber blades on the paddles.

## 8. OPERATION INSTRUCTIONS

Prior to starting engine, make sure mixer engagement lever is in the "IDLE" POSITION.

### Gas engine

1. Open the fuel valve.
2. Pull the stop switch on the engine shroud to its "Out" position.
3. Move the engine throttle control to the "FAST" position.
4. Choke the engine if necessary.(You may not need to choke a warm engine)
5. Pull the starter string.
6. After the engine starts, move the choke lever to the open position, move the throttle level to the "IDLE" position and let the engine warm-up for one or two minutes.

### Electric motor

1. Plug the motor into a suitable power source.
2. Move the switch on the motor to the "on" position.

### OPERATING

1. If using a gas engine, allow the engine to warm up then move the throttle to the fast position.
2. Close the engine shroud



**DO NOT OPERATE THE MIXER WITH THE SHROUD OPEN!**

3. Move the engagement lever into the "MIX" position and load the mixer.
4. After loading a batch of mortar, it is recommended to add water for the next batch.
5. After discharging the final batch of mortar, add water to the drum while the mixer is running. Discharge the water after the inside of the mixer is clean.

## 9. STARTING ENGINE

**IMPORTANT**  
Engine warranty is void if the engine is run without oil.

### GAS ENGINE

1. Move the engagement lever to the "IDLER" position.
2. Whenever possible it is recommended to let the engine idle before stopping.
3. Push in the engine stop switch on the engine shroud.
4. Close the fuel valve.

### ELECTRIC MOTOR

1. Move the switch on the motor to the "off" position.

### STOP THE ENGINE OR ELECTRIC MOTOR BEFORE:



- ✚ Adding fuel.
- ✚ Leaving equipment unattended for any amount of time.
- ✚ Making any repairs or adjustments to the unit.
- ✚ Transportation.

### TOWING:

1. Stop the engine or electric motor.
2. Close and hook the engine should.
3. Rotate the drum into the tow position and secured it with the locking pin.
4. Secure the mixer hitch and safety chains to the vehicle.

### BEFORE TOWING:



- ✚ Make sure the axle and tow bar hardware is tightened.
- ✚ Check the condition of the pin on the tow bar and make sure it is secured.
- ✚ Remove any loose debris from the mixer.
- ✚ Use safety chains when towing.

**MAXIMUM TOW SPEED: 45 mph**

## 10. SERVICE INSTRUCTIONS

- ✚ Never service or lubricate the unit engine while running.
- ✚ After servicing the unit, restore and fasten all guards, shields, and covers to their original positions.
- ✚ Never drain oil into the ground, into open streams, or down sewage drains.

### ENGINE

See engine owner's manual maintenance schedule.

### DRUM

1. Wash the drum after every day's usage.
2. Pull the locking pin and tip the drum forward to drain water excess.
3. Return drum to towing position and secure with locking pin before moving mixer.

### LUBRICATION

1. Grease all fittings daily. All mixers have 6 grease fittings, 4 pillow blocks and 2 drum trunnions. Two of the fittings are located at each end of the mixer drum on the top of pillow blocks and trunnions.  
The two remaining grease fittings are located under the engine shroud on the top of the intermediate shaft pillow blocks (see picture below).
2. Electric mixers only: oil the drive chain once a week.

## 11. MAINTENANCE SCHEDULE

	<i>Maintenance</i>	<i>Each use</i>	<i>Every 20 hours</i>	<i>Every 50 hours</i>	<i>Every 100 hours</i>	<i>Yearly</i>
Engine	Refer to engine operator/owner manual	X				X
Bearings	Grease	X				X
V-Belts	Check for excessive wear		X			X
Roller chain	Check for excessive wear		X			X
Hardware	Check and tighten 1,2		X	X		X
Tires	Check air pressure	X				

1. Check all hardware after the first 5 hours of use, then follow the maintenance schedule.
2. Re-torque the front leg and axle hardware after the first 50 miles traveled, and then follow the maintenance schedule.

## 12. REPLACEMENT

### Parts

### Tolerance or Replacement Cycle

#### Engine Components

- ✓ Refer to your engine manufacturer's Owner's Manual

#### V-Belts

- ✓ Replace if stretched to the point that the idler does not work properly. Replace the V-belts if they are cracked or torn.

#### Roller Chain

- ✓ Replace if there is excessive play between the links or the links are damaged.

#### Gears

- ✓ Replace if the teeth are cracked or have become sharp.

#### Hardware

- ✓ Re-torque all bolts after the first eight hours of operation and check hardware every 25 hours. Replace any worn or damaged hardware as needed. Replacement hardware should be grade 5 and zinc plated.

#### Safety Decals

- ✓ Replace if they become aged, damaged or cannot be easily read.

## 13. TORQUE CHART

### APROXIMATE TIGHTENING TORQUE

### APROXIMATE TIGHTENING TORQUE

SIZE	GRADE 2	GRADE 5	GRADE 8
# 10-24	21 in-lbs	32 in-lbs	45 in-lbs
# 10-32	23 in-lbs	36 in-lbs	51 in-lbs
1/4-20	49 in-lbs	76 in-lbs	9 in-lbs
1/4-28	56 in-lbs	87 in-lbs	10 in-lbs
5/16-18	8 in-lbs	13 in-lbs	18 in-lbs
5/16-24	9 in-lbs	14 in-lbs	20 in-lbs
3/8-16	15 in-lbs	23 in-lbs	33 in-lbs
3/8-24	17 in-lbs	26 in-lbs	37 in-lbs
7/16-14	24 in-lbs	37 in-lbs	52 in-lbs
7/16-20	27 in-lbs	41 in-lbs	58 in-lbs
1/2-13	37 in-lbs	57 in-lbs	80 in-lbs
1/2-20	41 in-lbs	64 in-lbs	90 in-lbs
9/16-12	53 in-lbs	82 in-lbs	115 in-lbs
9/16-18	59 in-lbs	82 in-lbs	129 in-lbs
5/8-11	73 in-lbs	112 in-lbs	159 in-lbs
5/8-18	83 in-lbs	112 in-lbs	180 in-lbs
3/4-10	129 in-lbs	223 in-lbs	282 in-lbs
3/4-16	144 in-lbs	200 in-lbs	315 in-lbs
7/8-9	125 in-lbs	322 in-lbs	454 in-lbs
7/8-14	138 in-lbs	355 in-lbs	501 in-lbs

SIZE	GRADE 2	GRADE 5	GRADE 8
1-8	188 ft-lbs	483 ft-lbs	682 ft-lbs
1-12	205 ft-lbs	529 ft-lbs	746 ft-lbs
1-14	210 ft-lbs	541 ft-lbs	764 ft-lbs
1-1/8-7	266 ft-lbs	596 ft-lbs	966 ft-lbs
1-1/8-12	297 ft-lbs	668 ft-lbs	1083 ft-lbs
1-1/4-7	375 ft-lbs	840 ft-lbs	1363 ft-lbs
1-1/4-12	415 ft-lbs	930 ft-lbs	1509 ft-lbs
1-3/8-6	491 ft-lbs	1102 ft-lbs	1787 ft-lbs
1-3/8-12	559 ft-lbs	1254ft-lbs	2034 ft-lbs
1-1/2-6	652 ft-lbs	1462ft-lbs	2371 ft-lbs
1-1/2-12	734 ft-lbs	1645ft-lbs	2668 ft-lbs
M 6	3 ft-lbs	4 ft-lbs	7 ft-lbs
M 8	6 ft-lbs	10 ft-lbs	18 ft-lbs
M 10	10 ft-lbs	20 ft-lbs	30 ft-lbs

#### CONVERSIONS

in - lbs x 0.083 = ft-lbs

ft - lbs x 12 = in-lbs

ft - lbs x 0.1383 = kg-m

ft - lbs x 1.3558 = N-m

## 14. HYDRAULIC CIRCUIT

### Hydraulic Circuit for “Automatic Dump” Mixer with Two-Spool Control Valves for Alternate Operation Design

The main beam of the mixer was designed as a hydraulic reservoir. The tank was sized to adequately cool the oil sufficiently, and provide tie to deaerate the oil, all without requiring the use of other heat exchangers or cooling fans.

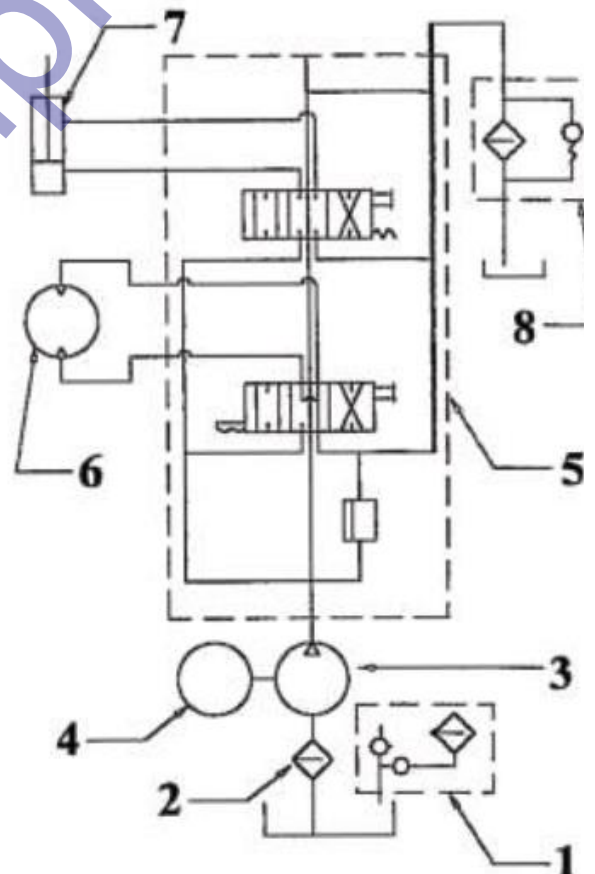
**CAUTION:** Breather cap is under pressure. Remove breather cap only when cool enough to touch with bare hands. Slowly loosen cap to relieve pressure before removing completely.

The reservoir is equipped with a pressurized breather filter (91) that reduces the out inflow of air due to thermal expansion and contraction of the hydraulic oil. This substantially reduces the amount of contaminants that can enter the reservoir.

To remove the breather cap-use a wrench on the hexagonal portion of the cap assembly which is located underneath the main body of the cap.

The pump (3) that is directly coupled to the engine (4) directs the hydraulic fluid to a double-spool directional control valve assembly (5). This valve assembly, with an internal pressure relief, set at 2100 psi (14.47 Mpa) controls both the paddle shaft motor (6) and the mix dumping cylinder (7). The mix dumping control valve is a 4-way, 3-position valve that is self-centering, springs return the spool to center neutral position. The paddle shaft motor control valve is also a 4-way, 3-position valve that is locked in the mixing mode, and self-centering in the reserve mode. This allows the paddle shaft to rotate in a counter-clockwise direction (mixing direction) without having to maintain a hand on the control lever. The hydraulic fluid returns to the reservoir via a conveniently located (for service) oil filter (8) with a 25 psi (0.17 Mpa) bypass.

1. Pressurized Breather Filter
2. Oil Strainer
3. Gear Pump
4. Engine
5. Directional Control Valve assembly with 2100 psi (14.47 Mpa) pressure relief
6. Paddle Shaft Motor
7. Mix Dumping Cylinder
8. Spin-on Filter with 5 psi (0.17 Mpa) bypass





## 15. HYDRAULIC MIXER SPECIFICATIONS

### THE POWER UNIT

This hydraulic system, powered by a 13 Honda gas engine, operating at 3400-3500 RPM, has been designed to develop more than 5100 inch pounds of torque and turn the paddle shaft at 33-34 RPM. The dump cycle is set for maximum speed of 5.5 seconds.

### THE PUMP

**The hydraulic system should be adjusted to operate at 2100 psi.** This high-strength extruded aluminum pump with bushing block pressure plates offers more performance and strength than the more economical "Die cast aluminum pumps. To achieve the longest possible life for both the engine and pump, the pump is mounted directly to the engine which assures the correct alignment with the paddle shaft...this is critical.

**SPECIAL NOTE: All settings on the hydraulic system are factory preset...field adjustments may void the warranty.**

### THE VALVES

The directional valves are high-performance. These newly designed valves offer low internal leakage which means more oil goes to the system for work and less heat is generated. An integral relief valve protects the hydraulic system from high pressure shock loading and excessive system pressure...relieving the oil to the tank.

### THE HYDRAULIC MOTOR

The hydraulic motor is a disc valve design as opposed to a motor shaft/spool design. This motor offers the highest performance with the least internal fluid loss. This disc valve design motor offers a higher bearing load capability than most competitive units... this means longer life for the hydraulic motor.

The correct operating fluid level is when the "LUBE-sight" plug is  $\frac{3}{4}$  full.

### THE TANK FRAME

Allowing for heated-fluid expansion, this tank holds 14.6 gallons of hydraulic oil. A "LUBE-sight" plug has been mounted on the tank so that fluid levels can be monitored.

### THE PRESSURIZED BREATHER/FILLER CAP:

Maintains a 5 psi positive head pressure on oil in the tank - keeping the air exchange and ingestion of concrete dust in to the hydraulic system at a minimum.

The blanket pressure of 5 pas also assists in priming the hydraulic pump forcing fluid from tank to pump inlet.

1. All hydraulic fluid is filtered as it is returned to the tank.
2. Heavy – duty “chain style” sprocket increases the torque transfer.
3. Pressure connections are sealed o-ring boss style fittings.
4. Hose connections are JIC style flare with swivels.
5. Low pressure connections are NPT with sur-lok pipe sealant.
6. Heavy Duty safety duty grade with built in bag cutter.
7. Durable paddle shaft of 1-3/4" square hardened steel. Double sealed bearings with eight spring loaded greased shaft seals.
8. Heavy-duty schedule 80 steel removable tow/hitch
9. Solid 1 5/8" axle with large 878x13" tires for smooth towing. Suspension springs standard less bounce, less sway.
10. Rugged 14 gauge steel engine cover with punches pressed ventilation openings for increased cooling and added strength.
11. Dual controls-mixing blades and optional hydraulic pump.



MODEL	HM20	HM160
<b>Batch Capacity bags</b>	3 1/2 - 4	4 1/2 - 5 1/2
<b>Batch capacity cu. ft. (Its)</b>	12 (340)	16 (450)
<b>Power Sources</b>	5HP 1 230/460V Electric 5HP 2 230/460V Electric 13HP Honda	5HP 1 230/460V Electric 5HP 2 230/460V Electric 13HP Honda
<b>Average weight – lbs. (kg)</b>	1430 (650)	1529 (695)
<b>Length with tongue x W x H - in (cm)</b>	99 x 55 x 66 (251 x 139 x 167)	102 x 55 x 66 (259 x 139 x 167)
<b>Height not including handle - in (cm)</b>	66 (167)	66 (167)
<b>Discharge height - in (cm)</b>	23 (58)	23 (58)
<b>Drive</b>	Hydraulic	Hydraulic
<b>Dump action</b>	Manual (Optional Hydraulic dump)	Hydraulic Dump

Mixer weight shown is an average; exact weight is dependent upon power source.












Dual controls-mixing blades and optional hydraulic pump

Hydraulic Oil Type	HM12GH13	HM16GH13
<b>ENGINE</b>	SAE 15W40	SAE 15W40
<b>HYDRAULIC SYSTEM</b>	HIDRO-68	HIDRO-68



## 16. WARRANTY

### THIS IS YOUR WARRANTY - PLEASE READ AND SAVE

1.  Warrants each new machine against any defect in material and workmanship under normal use and service for a period of six (6) months. This warranty start the first the machine is sold, assigned to a rental fleet, or otherwise get into its first use.
2. The obligation under this warranty is limited to the replacement of parts at your factory branch or an authorized  distributor.
3. Machines altered or modified without a  written consent, may void this warranty policy immediately. Misuse, negligence, accidents or the operation of the machines in any other way that the recommended by  operation procedures, will void this warranty policy. This warranty shall not apply to machines repaired by other than  authorized branches or distributors.
4. The cost of transportation and other expenses related are not covered by this warranty.
5. Written authorization for the return of merchandise under warranty must be obtain from  customer service contact.
6.  Reserves the right to inspect and render the final decision on each warranty case.
7.  Reserves the right to improve or make product changes without incurring any obligation to update, refit or install on machines previously sold.
8.  Is not responsible for any liability, damage or injury directly or indirectly from the design, material or operation of its product.
9. The warranty letter must be returned to  within 10 days after purchase/adquire, for a first use failure warranty claim. Failure to return the warranty letter as specified renders the warranty null and void.
10. Warranty request must be submitted in written within 30 days after machine failure to  customer service.
11. THE FOREIGN WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANT ABILITY AND FITNESS FOR USE AND OF ALL OTHER OBLIGATION OR LIABILITIES ON OUR PART, AND WE NEITHER ASSUME FAILURES ON ENGINES, MOTORS AND THEIR COMPONENTS.



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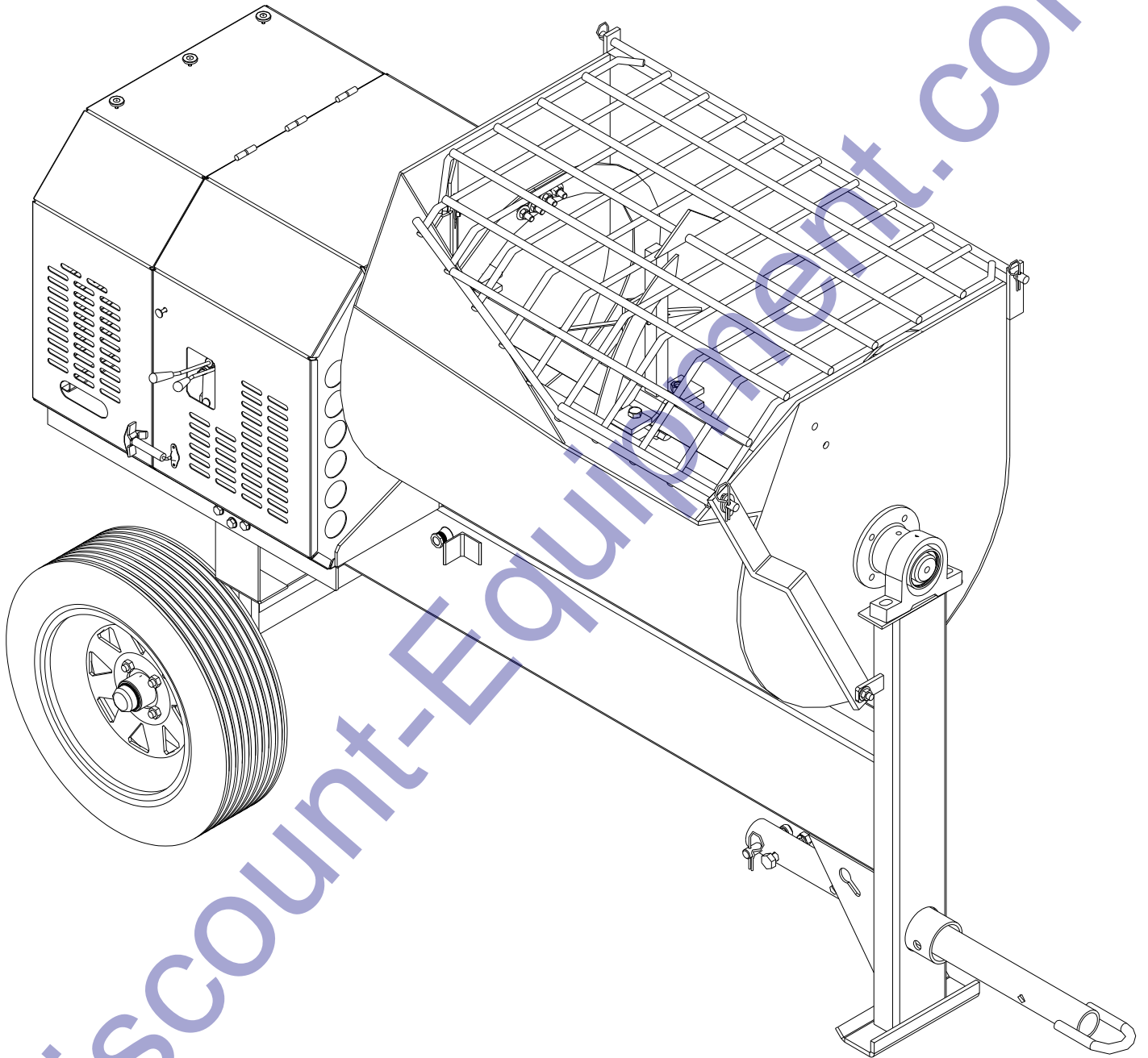
Please have the machine model and serial number available in order to help us get you the correct parts. One of our experienced staff members will get back to you with a quote for the right part that your machine needs.

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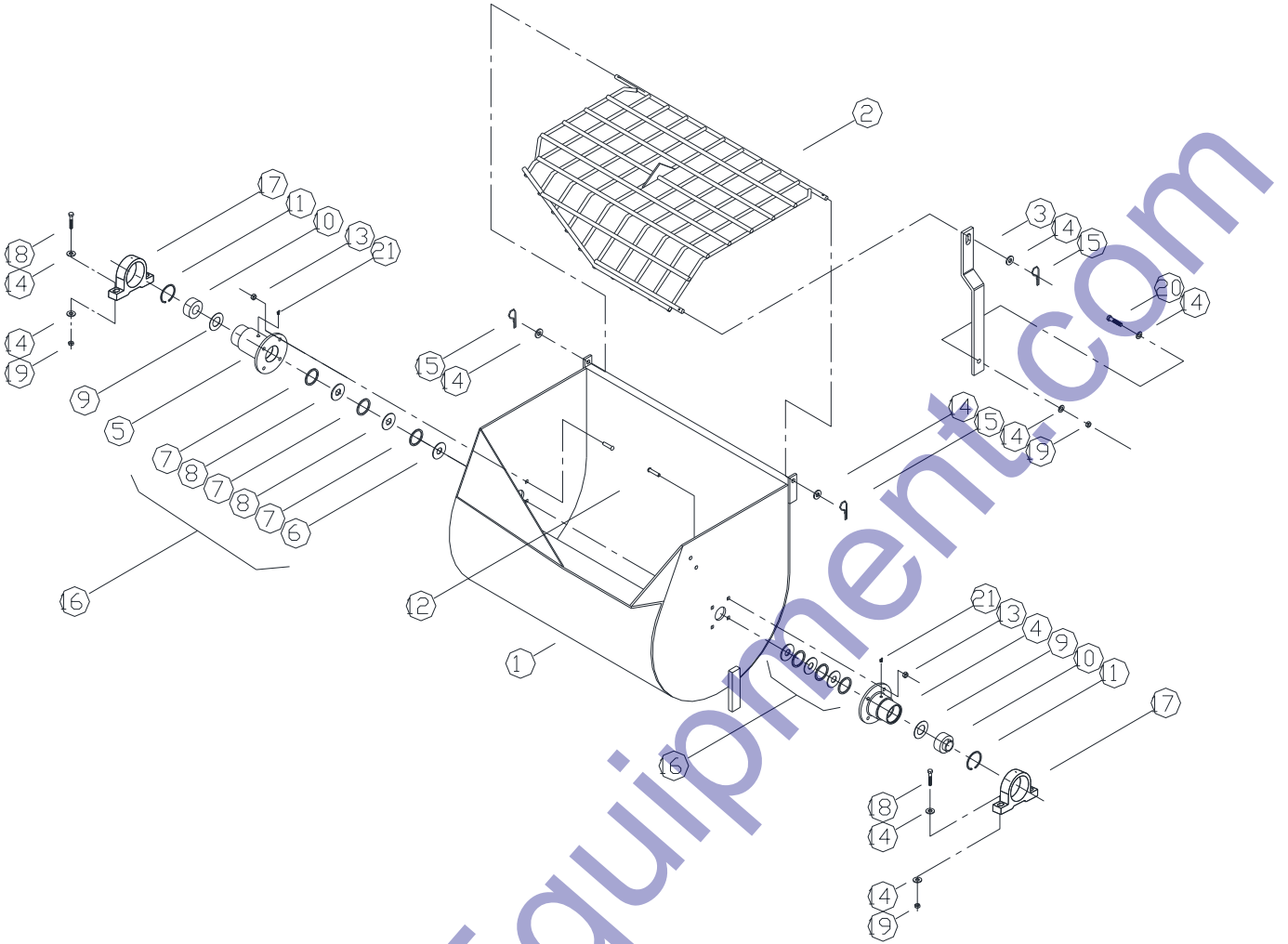


# REPAIR PARTS MANUAL / MANUAL DE PARTES

## HYDRAULIC MIXER HM12

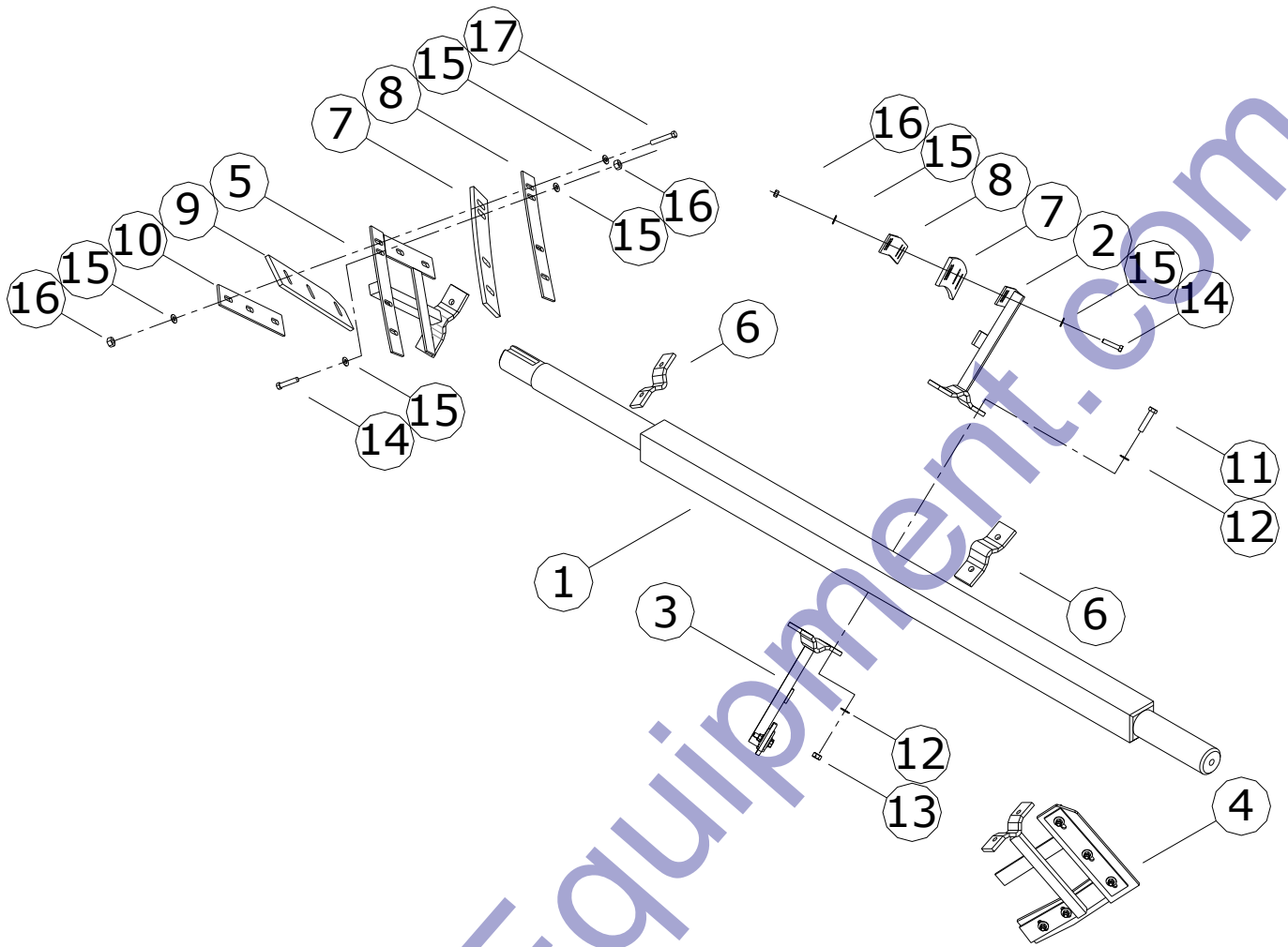


## DRUM ASSEMBLY / ENSAMBLE TANQUE



No.	Part Num.	Número de Parte	Description	Descripción	Qty/Cant.
1	T700		Drum, HM12	Tanque HM12	1
2	T701		Grid, HM12	Rejilla HM12	1
3	T115	0200SO01RJ	Handle Grid	Palanca Rejilla	1
4	T173-2	0200CO01TN	Trunnion	Trunnion	1
5	T702		Hyd, Trunnion	Trunnion Hidraulico	1
6	T703		Red Rubber	Hule Rojo	2
7	T704		Flat Washer, 1/8 x 3	Rondana Plana, 1/8 x 3	6
8	T705		Black Rubber	Hule Negro	4
9	T706		Steel Seal C-29	Lamina Acero	2
10	T175	0200KI02TN	Ball Bearing 208-24	Balero 208-24	2
11	T177	SM00300INT	Retaining Ring 3" External	Seguro Omega 3" Exterior	2
12	T174	TOCL038112	Carriage Bolt, 3/8 x 1-1/2	Tomillo Cabeza Coche 3/8 x 1-1/2	8
13	T114	TCCS038GAL	Lock Nut, 3/8	Tuerca de Seguridad 3/8	8
14	T105	RNPX012GAL	Flat Washer, 1/2 SAE	Rondana Plana, 1/2 SAE	13
15	T110	SR00036EXT	Pin, Hair 3/16	Seguro R, 3/16	3
16	T172	0200KI01TN	Kit, Rubber Seal	Kit, Empaques de Hule	2
17	T101	00CHPI2300	Pillow Block, 3"	Chumacera Tanque 3" PI	2
18	T104	TOCD012212	Hex Head Bolt, 1/2 x 2-1/2	Tomillo Hex 1/2 x 2-1/2	4
19	T106	TCCS012GAL	Lock Nut, 1/2	Tuerca de Seguridad 1/2	5
20	T189	TOCD012134	Hex Head Bolt, 1/2 x 1-3/4	Tomillo Hex 1/2 x 1-3/4	1
21	T102	0000GRH045	Fitting, Grease 45 Deg.	Grasera, 45 grados	2

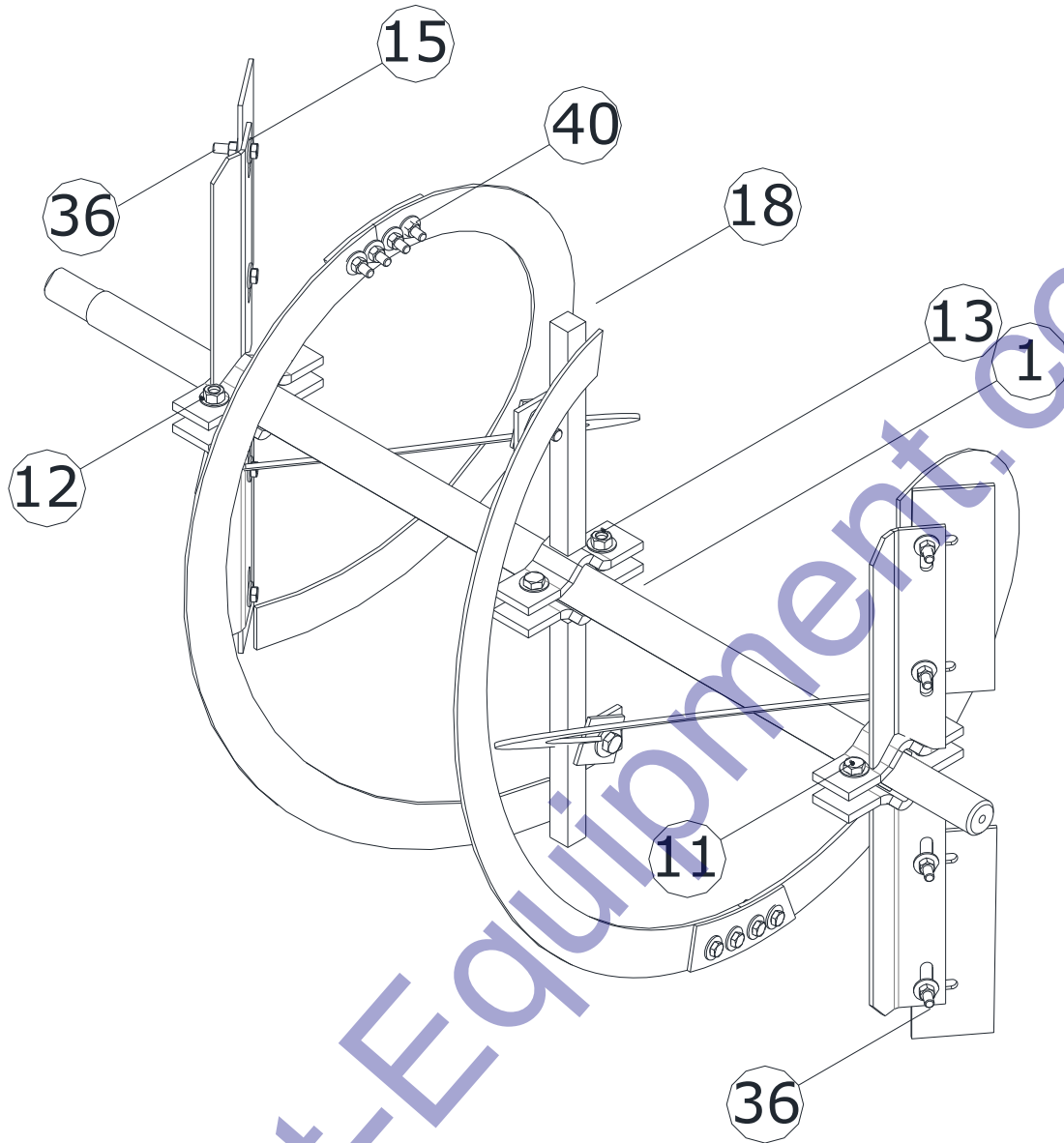
## PADDLE ASSEMBLY / ENSAMBLE ASPAS



No.	Part Num.	Número de Parte	Description	Descripción	Qty/Cant.
1	T741	0205CC01CH	Main Shaft, HM12	Flecha Central HM12	1
2	T306	0200CO01AS	Paddle, Middle right	Aspa Central Derecha	1
3	T308	0200CO02AS	Paddle, Middle Left	Aspa Central Izquierda	1
4	T314	0200CO03AS	Paddle, Right Arm	Aspa Lateral Derecha	1
5	T309	0200CO04AS	Paddle, Left Arm	Aspa Lateral Izquierda	1
6	T188	0200SO05AS	Paddle Arm Bracket	Abrasadera	2
7	T307	0200RF01AS	Rubber, Center Blade	Hule Central	4
8	T181	0200SO01AS	Center Blade	Contra Aspa Central	4
9	T310	0200RF02AS	Rubber, Side Blade	Hule Lateral	2
10	T311	0200SO02AS	Side Blade	Contra Aspa Lateral	2
11	T189	TOCD012134	Hex Head Bolt, 1/2 x 1-3/4	Tomillo Hex 1/2 x 1-3/4	6
12	T105	RNPX012GAL	Flat Washer, 1/2 SAE	Rondana Plana, 1/2 SAE	12
13	T106	TCCS012GAL	Lock Nut, 1/2	Tuerca de Seguridad 1/2	6
14	T176	TOCD038112	Hex Head Bolt, 3/8 x 1-1/2	Tomillo Hex 3/8 x 1-1/2	18
15	T112	RNPX038GAL	Flat Washer, 3/8 SAE	Rondana Plana, 3/8 SAE	40
16	T114	TCCS038GAL	Lock Nut, 3/8	Tuerca de Seguridad 3/8	20
17	T145	TOCD038200	Hex Head Bolt, 3/8 x 2	Tomillo Hex 3/8 x 2	2

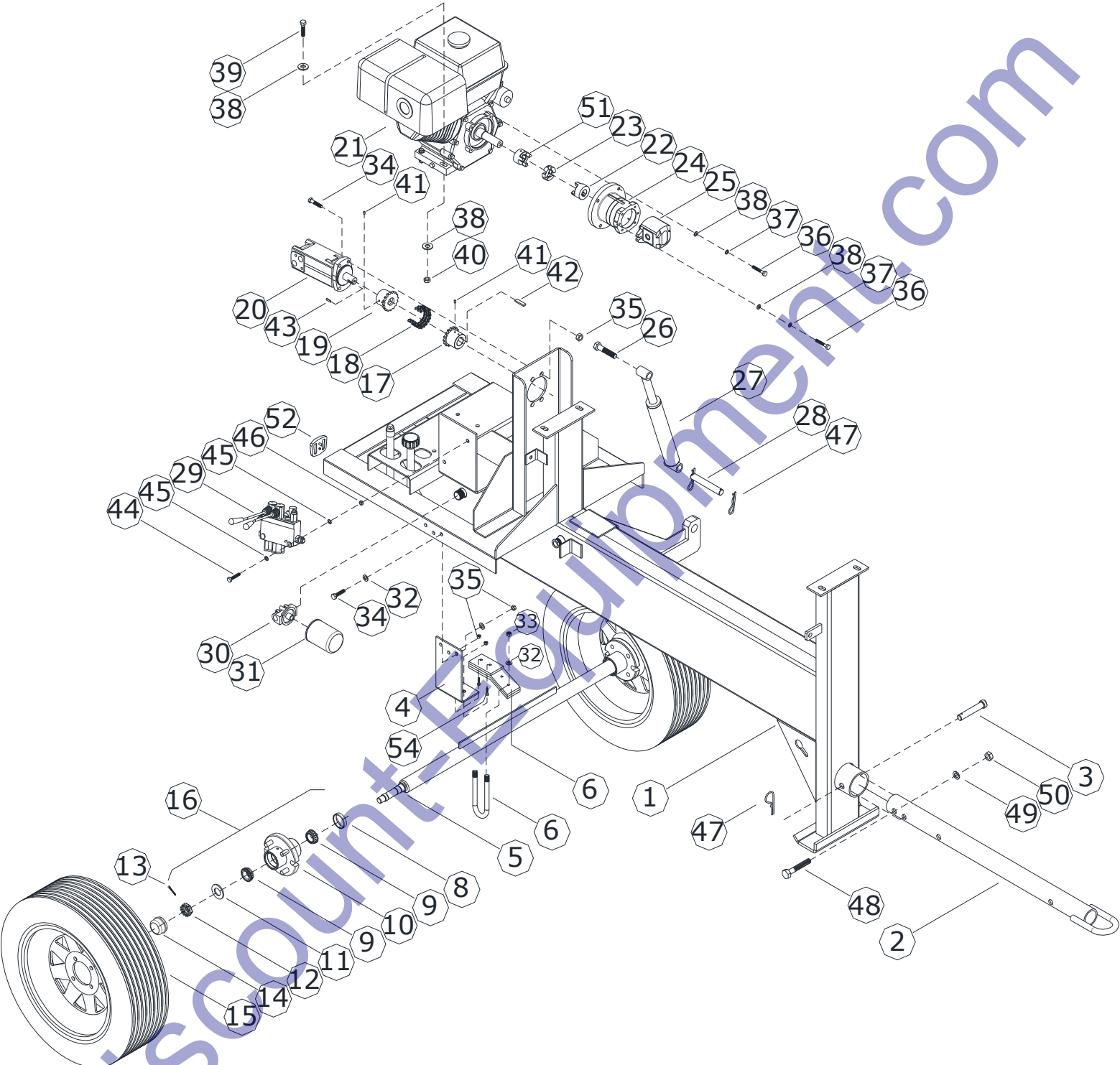


**SPIRAL ASSEMBLY / ENSAMBLE DE ASPAS**



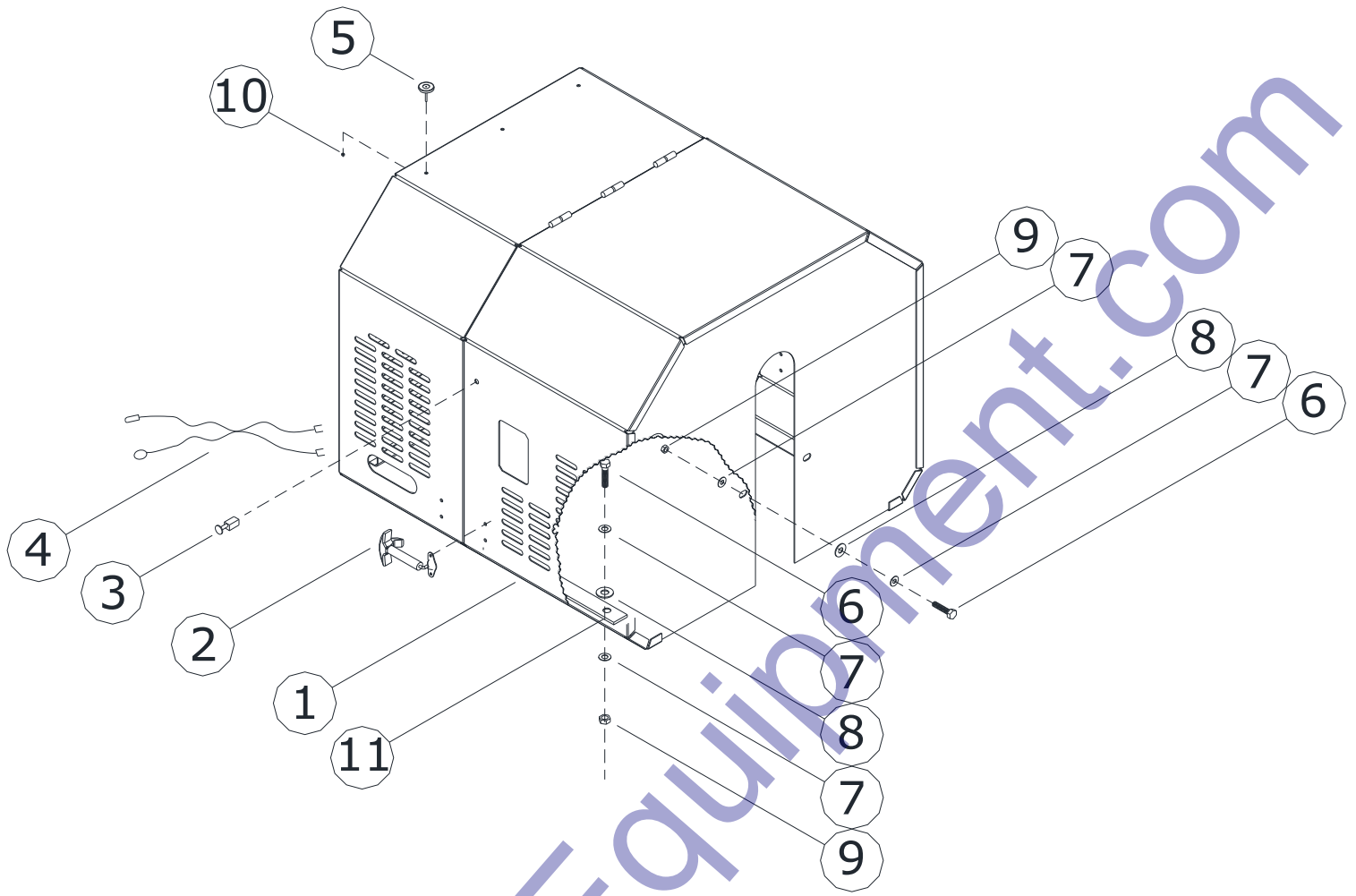
No.	Part Num.	Número de Parte	Description	Descripción	Qty/Cant.
1	T741	0205CC01CH	Main Shaft, HM12	Flecha Central HM12	1
11	T189	TOCD012134	Hex Head Bolt, 1/2 x 1-3/4	Tomillo Hex 1/2 x 1-3/4	6
12	T105	RNPX012GAL	Flat Washer, 1/2 SAE	Rondana Plana, 1/2 SAE	12
13	T106	TCCS012GAL	Lock Nut, 1/2	Tuerca de Seguridad 1/2	6
18	T742		Spiral Asembly, HM12	Ensamble Espiral, HM12	1
15	T112	RNPX038GAL	FLat Washer, 3/8 SAE	Ensamble Espiral, HM12	32
36	T176	TOCD038112	Hex Head Bolt, 3/8 x 1-1/2	Ensamble Espiral, HM12	16
40	T114	TCCS038GAL	Lock nut, 3/8	Tuerca de Seguridad 3/8	16

# FRAME ASSEMBLY / ENSEMBLE CHASSIS



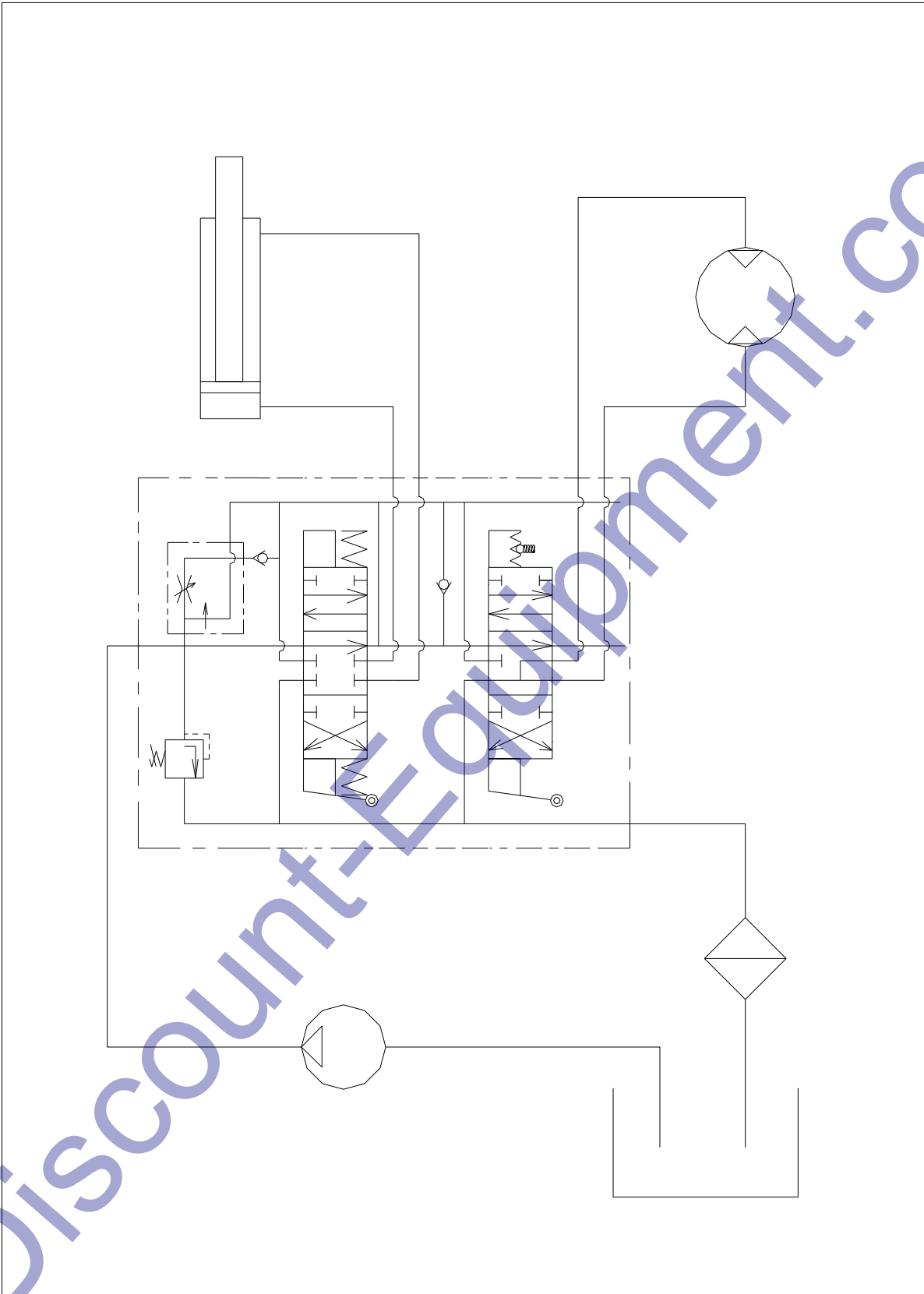
No.	Part Num.	Número de Parte	Description	Descripción	Qty/Cant.
1	T707		Main Frame, HM12	Chasis HM12	1
2	T118	0200CO01LZ	Pintle Hitch	Lanza Militar	1
3	T121	0200CR01LZ	Lock Pin	Perno Lanza	1
4	T708		Axle Bracket	Soporte para Eje	2
5	T709		Axle HM	Eje HM	1
6	T710		"U" Clamp	Abrazadera U	2
8	T130	0000RF01RD	Seal, grease	Reten	2
9	T131	0000RF02RD	Bearing, 6205	Balero 6205	2
10	T141	0000RF08RD	Rim Hub	Masa Rim	2
11	T132	0000RF03RD	Plain Washer, 1/8 x 3/4 x 1-1/4	Rondana Plana 1/8 x 3/4 x 1-1/4	2
12	T134	0000RF05RD	Nut, Castle 3/4	Tuerca Castillo 3/4	2
13	T135	SC18112NOR	Pin, Cotter 1/8 x 1-1/2	Chaveta 1/8 x 1-1/2	2
14	T136	0000RF06RD	Cover, Dust	Cubre Polvo Masa Rim	2
15	T137	0000CO01RD	Wheel and Tire	Llanta y Rim	2
16	T129	0200KI01RD	Hub, 4 bolt, Assy	Ensamble Masa Rim	2
17	T712		Sprocket	Catarina Flecha Central	1
18	T713		Chain	Cadena de Transmisión	1
19	T714		Pump Sprocket	Catarina para Bomba	1
20	T715		Hydraulic Motor	Motor Hidraulico	1
21	T716		Engine,	Motor	1
22	T717		Coupler, 3/4"	Muela, 3/4"	2
23	T718		Insert	Cople para Muela	1
24	T719		Adaptor Pump/Motor	Montaje de Bomba hidraulica	1
25	T720		Hydraulic Pump	Bomba Hidraulica	1
26	T721		Hex Head Bolt, 1" x 3-1/2"	Tomillo 1" x 3-1/2"	1
27	T722		Cylinder	Gato Hidraulico	1
28	T723		Pin, Cylinder	Perno Gato Hidraulico	1
29	T724		Valve, 2 Spool Press Comp	Válvula Hidraulica	1
30	T725		Filter Coupler	Adaptador para Filtro	1
31	T726		Oil Filter	Filtro de Aceite	1
32	T105	RNPX012GAL	Flat Washer, 1/2 SAE	Rondana Plana 1/2 SAE	16
33	T727		Nut, 1/2 NF	Tuerca 1/2 NF	4
34	T189	TOCD012134	Hex Head Bolt, 1/2 x 1-3/4	Tomillo Hex 1/2 x 1-3/4	10
35	T728		Lock Nut, 1/2	Tuerca de Seguridad 1/2	12
36	T176	TOCD038112	Hex Head Bolt, 3/8 x 1-1/2	Tomillo Hex 3/8 x 1-1/2	8
37	T729		Lock Washer, 3/8	Rondana Presión 3/8	8
38	T112	RNPX038GAL	Flat Washer, 3/8 SAE	Rondana Plana 3/8 SAE	16
39	T145	TOCD038200	Hex Head Bolt, 3/8 x 2	Tomillo Hex 3/8 x 2	4
40	T114	TCCS038GAL	Lock Nut, 3/8	Tuerca de Seguridad 3/8	4
41	T730	OPCR516516	Set Screw, 5/16 x 5/16	Opresor, 5/16 x 5/16	4
42	T731		Key, 1/2 x 2	Cuña, 1/2 x 2	1
43	T732		Key, 1/4 x 2	Cuña, 1/4 x 2	1
44	T733	TOCD516134	Hex Head Bolt, 5/16 x 1-3/4	Tomillo Hex 5/16 x 1-3/4	2
45	T734		Flat Washer, 5/16	Rondana Plana 5/16	4
46	T735		Lock Nut, 5/16	Tuerca de Seguridad 5/16	2
47	T736			Seguro R, 3/16	3
48	T737		Hex Head Bolt, 3/4 x 3-1/2 NF	Tomillo Hex 3/4 x 3-1/2 NF	1
49	T738		Lock Washer, 3/4	Rondana Presión 3/4	1
50	T739		Nut, 3/4 NF	Tuerca 3/4 NF	1
51	T740		Coupler, 1"	Muela, 1"	1
52	T760		Reflective	Reflejantes	2
53	T800		Spring	Muey	2
54	T104	TOCD012212	Hex Head Bolt, 1/2 x 2-1/2	Tomillo de 1/2 x 2-1/2	2

## HOOD ASSEMBLY / ENSAMBLE GABINETE



No.	Part Num.	Número de Parte	Description	Descripción	Qty/Cant.
1	T743		HM Hood	Gabinete HM	1
2	T116	0000RF02GA	Hook	Seguro Cofre	1
3	T195	0000RF04GA	Switch	Push Stop	1
4	T170	0200RF01GB	Electric Harness	Arnes Eléctrico	1
5	T158	0000RF01GA	Rubber Screw	Regaton	3
6	T744	TOCD038114	Hex Head Bolt, 3/8 x 1-1/4	Tornillo Hex 3/8 x 1-1/4	6
7	T745	RNPX038ESP	Flat Washer Sp. 3/8	Rondana Plana Esp. 3/8	12
8	T746	RNPX012ESP	Flat Washer Sp. 1/2	Rondana Plana Esp. 1/2	6
9	T114	TCCS038GAL	Lock Nut, 3/8	Tuerca de Seguridad 3/8	6
10	T159	TCCS014GAL	Lock Nut, 1/4	Tuerca de Seguridad 1/4	3
11	T800		Support	Soporte gabinete	2

HYDRAULIC SCHEMATIC / ESQUEMA HIDRÁULICO



Prt No.	Description / Descripción	Location	Ubicación	Qty
T747	Hose, 1/2 x 29", 1/2 NPT ~ 1/2 NPT / Manguera, 1/2 x 29", 1/2 NPT ~ 1/2 NPT	Oil Tank to Hyd Pump	Tanque a Bomba Hid.	1
T748	Hose, 1/2 x 20", 1/2 NPT ~ 1/2 NPT / Manguera, 1/2 x 20", 1/2 NPT ~ 1/2 NPT	Hyd Pump to Valve	Bomba Hid. A Válvula	1
T749	Hose, 1/2 x 24", 1/2 NPT ~ 1/2 NPT / Manguera, 1/2 x 24", 1/2 NPT ~ 1/2 NPT	Valve to Hyd Motor	Válvula a Motor Hid.	2
T750	Hose, 1/2 x 52", 1/2 NPT ~ 1/2 NPT / Manguera, 1/2 x 52", 1/2 NPT ~ 1/2 NPT	Valve to Cylinder	Válvula a Pistón	2
T751	Hose, 1/2 x 10", 1/2 NPT ~ 1/2 NPT / Manguera, 1/2 x 10", 1/2 NPT ~ 1/2 NPT	Valve to Filter	Válvula a Filtro	1
T752	Elbow, 1/2 NPT ~ 1/2 NPT / Codo, 1/2 NPT ~ 1/2 NPT	Cylinder	Pistón	1
T753	Elbow, 5/8 NPT ~ 1/2 NPT / Codo, 5/8 NPT ~ 1/2 NPT	Hyd Motor	Motor Hidraulico	2
T754	Elbow, Long, 1/2 NPT ~ 1/2 NPT / Codo largo, 1/2 NPT ~ 1/2 NPT	Hyd Pump	Bomba Hidraulica	1
T753	Elbow, 5/8 NPT ~ 1/2 NPT / Codo, 5/8 NPT ~ 1/2 NPT	Hyd Pump	Bomba Hidraulica	1
T755	Cap, 1/2 / Tapon, 1/2	Valve	Válvula	2
T752	Elbow, 1/2 NPT ~ 1/2 NPT / Codo, 1/2 NPT ~ 1/2 NPT	Valve	Válvula	4
T756	Elbow, Long, 1/2 NPT ~ 1/2 NPT / Codo largo, 1/2 NPT ~ 1/2 NPT	Valve	Válvula	2
T757	Collector Reducer Coupling, 1/2 NPT ~ 3/4 Male / Cople Colector Reductor, 1/2 NPT ~ 3/4 Macho	Filter	Filtro	1
T758	Elbow, 3/4 Female ~ 3/4 Male / Codo, 3/4 Hembra ~ 3/4 Macho	Filter	Filtro	1
T759	Niple, 3/4 NPT	Filter	Filtro	1

### HYDRAULIC HOSES & FITTINGS / MANGUERAS HIDRÁULICAS Y CONEXIONES