

STANLEY

®

HP18289M

HYDRAULIC DIESEL POWER UNIT

⚠ WARNING

SERIOUS INJURY OR DEATH
COULD RESULT FROM IM-
PROPER REPAIR OR SERVICE
OF THIS TOOL.

REPAIRS AND/OR SERVICE
TO THIS TOOL MUST ONLY
BE DONE BY AN AUTHORIZED
AND CERTIFIED DEALER.

⚠ WARNING

To avoid serious injury or death



Read the Manual



Wear Eye
Protection



Wear Ear
Protection



Wear Dust Mask

47351



SAFETY, OPERATION AND MAINTENANCE SERVICE MANUAL

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SERVICING THE STANLEY POWER UNIT: This manual contains safety, operation, and routine maintenance instructions. Stanley Hydraulic Tools recommends that servicing of hydraulic tools, other than routine maintenance, must be performed by an authorized and certified dealer. Please read the following warning.

⚠ WARNING

SERIOUS INJURY OR DEATH COULD RESULT FROM THE IMPROPER REPAIR OR SERVICE OF THIS TOOL.

REPAIRS AND / OR SERVICE TO THIS TOOL MUST ONLY BE DONE BY AN AUTHORIZED AND CERTIFIED DEALER.

For the nearest authorized and certified dealer, call Stanley Hydraulic Tools at the number listed on the back of this manual and ask for a Customer Service Representative.

SAFETY SYMBOLS

Safety symbols and signal words, as shown below, are used to emphasize all operator, maintenance and repair actions which, if not strictly followed, could result in a life-threatening situation, bodily injury or damage to equipment.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



This safety alert and signal word indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.



This safety alert and signal word indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.



This safety alert and signal word indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



This signal word indicates a potentially hazardous situation which, if not avoided, may result in property damage.



This signal word indicates a situation which, if not avoided, will result in damage to the equipment.



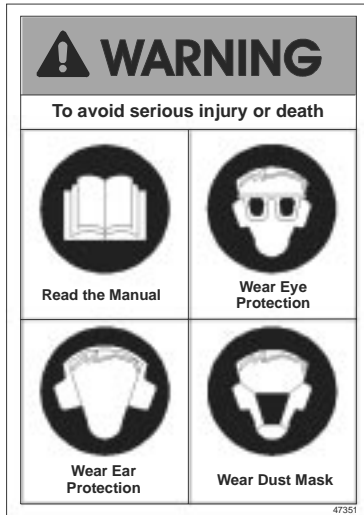
This signal word indicates a situation which, if not avoided, may result in damage to the equipment.

Always observe safety symbols. They are included for your safety and for the protection of the tool.

LOCAL SAFETY REGULATIONS

Enter any local safety regulations here. Keep these instructions in an area accessible to the operator and maintenance personnel.

SAFETY PRECAUTIONS



Tool operators and maintenance personnel must always comply with the safety precautions given in this manual and on the stickers and tags attached to the equipment.

These safety precautions are given for your safety. Review them carefully before operating the tool and before performing general maintenance or repairs.

Supervising personnel should develop additional precautions relating to the specific work area and local safety regulations. If so, place the added precautions in the space provided on page 4.

In addition to this manual, read and understand safety and operating instructions in the Engine Operation Manual furnished with the power unit.

The HP18289M Hydraulic Diesel Power Unit will provide safe and dependable service if operated in accordance with the instructions given in this manual. Read and understand this manual and any stickers and tags attached to the Power Unit. Failure to do so could result in personal injury or equipment damage.

- Operator must start in a work area without bystanders. The operator must be familiar with all prohibited work areas such as excessive slopes and dangerous terrain conditions.
- Establish a training program for all operators to ensure safe operation.
- Do not operate the power unit unless thoroughly trained or under the supervision of an instructor.
- Always wear safety equipment such as goggles, ear, head protection, and safety shoes at all times when operating the power unit and a hydraulic tool.
- Do not inspect or clean the power unit while it is running. Accidental engagement of the unit can cause serious injury.
- Always use hoses and fittings rated at 2500 psi/172 bar with a 4 to 1 safety factor. Be sure all hose connections are tight.
- Be sure all hoses are connected for correct flow direction to and from the tool being used.
- Do not inspect hoses and fittings for leaks by using bare hands. "Pin-hole" leaks can penetrate the skin.
- NEVER OPERATE THE POWER UNIT IN A CLOSED SPACE. Inhalation of engine exhaust can be fatal.
- Do not operate a damaged, improperly adjusted power unit.
- Never wear loose clothing that can get entangled in the working parts of the power unit.
- Keep all parts of your body away from the working parts of the power unit.
- Keep clear of hot engine exhaust.
- Do not add fuel to the power unit while the power unit is running or is still hot.
- Do not operate the power unit if gasoline odor is present.
- Do not use flammable solvents around the power unit engine.
- Do not operate the power unit within 3.3 ft/1 m of buildings, obstructions or flammable objects.
- Do not reverse tool rotation direction by changing fluid flow direction.
- Allow power unit engine to cool before storing in an enclosed space.
- Always keep critical tool markings, such as labels and warning stickers legible.
- To avoid personal injury or equipment damage, all tool repair, maintenance and service must only be performed by authorized and properly trained personnel.

TOOL STICKERS & TAGS

CAUTION
CERTAIN PARTS OF THE POWER UNIT WILL BE HOT.
AVOID CONTACT WITH THOSE PARTS TO PREVENT INJURY.

28047
HOT PARTS DECAL
(located on dash panel)

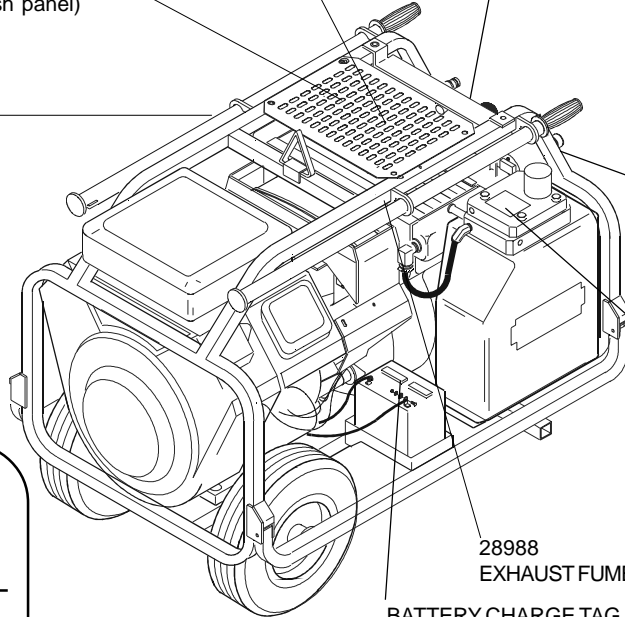
DANGER
OPERATE UNIT ONLY IN A WELL VENTILATED AREA. ENGINES PRODUCE CARBON MONOXIDE WHICH IS AN ODORLESS DEADLY POISON.

28046
CARBON MONOXIDE DECAL
(located on dash panel)

15875
SAFETY TAG (shown below)
(Do not remove until read)

DIESEL FUEL ONLY

32331
DIESEL FUEL ONLY DECAL
(located on fuel tank)



SERIAL NO. LOCATION
(At top of dash panel)

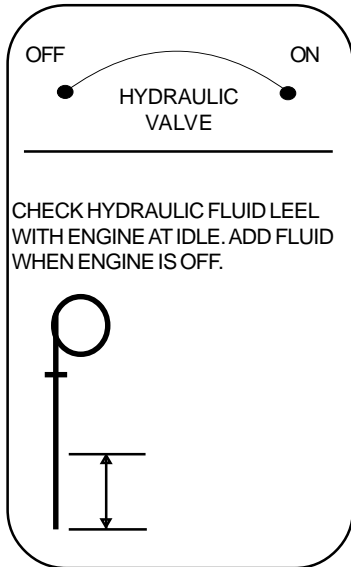
HYDRAULIC FLUID

35686
HYDRAULIC FLUID DECAL
(located on hydraulic tank filter block)



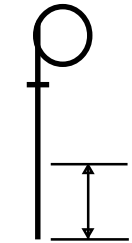
28988
EXHAUST FUMES STICKER

BATTERY CHARGE TAG
(Do not remove until read)



OFF ON
HYDRAULIC VALVE

CHECK HYDRAULIC FLUID LEVEL WITH ENGINE AT IDLE. ADD FLUID WHEN ENGINE IS OFF.



51297
CHECK HYDRAULIC FLUID DECAL
(located on dash panel)

The safety tag at right is attached to the power unit when shipped from the factory. Read and understand the safety instructions listed on this tag before removal. We suggest you retain this tag and attach it to the tool when not in use.

DANGER

- FAILURE TO USE HYDRAULIC HOSE LABELED AND CERTIFIED AS NON-CONDUCTIVE WHEN USING HYDRAULIC TOOLS ON OR NEAR ELECTRICAL LINES MAY RESULT IN DEATH OR SERIOUS INJURY.
BEFORE USING HOSE LABELED AND CERTIFIED AS NON-CONDUCTIVE ON OR NEAR ELECTRICAL LINES BE SURE THE HOSE IS MAINTAINED AS NON-CONDUCTIVE. THE HOSE SHOULD BE REGULARLY TESTED FOR ELECTRIC CURRENT LEAKAGE IN ACCORDANCE WITH YOUR SAFETY DEPARTMENT INSTRUCTIONS.
- A HYDRAULIC LEAK OR BURST MAY CAUSE OIL INJECTION INTO THE BODY OR CAUSE OTHER SEVERE PERSONAL INJURY.
A. DO NOT EXCEED SPECIFIED FLOW AND PRESSURE FOR THIS TOOL. EXCESS FLOW OR PRESSURE MAY CAUSE A LEAK OR BURST.
B. DO NOT EXCEED RATED WORKING PRESSURE OF HYDRAULIC HOSE USED WITH THIS TOOL. EXCESS PRESSURE MAY CAUSE A LEAK OR BURST.
C. CHECK TOOL HOSE COUPLERS AND CONNECTORS DAILY FOR LEAKS. DO NOT FEEL FOR LEAKS WITH YOUR HANDS. CONTACT WITH A LEAK MAY RESULT IN SEVERE PERSONAL INJURY.

IMPORTANT

READ OPERATION MANUAL AND SAFETY INSTRUCTIONS FOR THIS TOOL BEFORE USING IT.

USE ONLY PARTS AND REPAIR PROCEDURES APPROVED BY STANLEY AND DESCRIBED IN THE OPERATION MANUAL.

TAG TO BE REMOVED ONLY BY TOOL OPERATOR. 15875

DANGER

- DO NOT LIFT OR CARRY TOOL BY THE HOSES. DO NOT ABUSE HOSE. DO NOT USE KINKED, TORN OR DAMAGED HOSE.
- MAKE SURE HYDRAULIC HOSES ARE PROPERLY CONNECTED TO THE TOOL BEFORE PRESSURING SYSTEM. SYSTEM PRESSURE HOSE MUST ALWAYS BE CONNECTED TO TOOL "IN" PORT. SYSTEM RETURN HOSE MUST ALWAYS BE CONNECTED TO TOOL "OUT" PORT. REVERSING CONNECTIONS MAY CAUSE REVERSE TOOL OPERATION WHICH CAN RESULT IN SEVERE PERSONAL INJURY.
- DO NOT CONNECT OPEN-CENTER TOOLS TO CLOSED-CENTER HYDRAULIC SYSTEMS. THIS MAY RESULT IN LOSS OF OTHER HYDRAULIC FUNCTIONS POWERED BY THE SAME SYSTEM AND/OR SEVERE PERSONAL INJURY.
- BYSTANDERS MAY BE INJURED IN YOUR WORK AREA. KEEP BYSTANDERS CLEAR OF YOUR WORK AREA.
- WEAR HEARING, EYE, FOOT, HAND AND HEAD PROTECTION.
- TO AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE, ALL TOOL REPAIR MAINTENANCE AND SERVICE MUST ONLY BE PERFORMED BY AUTHORIZED AND PROPERLY TRAINED PERSONNEL.

IMPORTANT

READ OPERATION MANUAL AND SAFETY INSTRUCTIONS FOR THIS TOOL BEFORE USING IT.

USE ONLY PARTS AND REPAIR PROCEDURES APPROVED BY STANLEY AND DESCRIBED IN THE OPERATION MANUAL.

TAG TO BE REMOVED ONLY BY TOOL OPERATOR. 15875

SAFETY TAG (shown smaller than actual size)

HYDRAULIC HOSE REQUIREMENTS

HOSE TYPES

Hydraulic hose types authorized for use with Stanley Hydraulic Tools are as follows:

- ① Certified non-conductive
- ② Wire-braided (conductive)
- ③ Fabric-braided (not certified or labeled non-conductive)

Hose ① listed above is the only hose authorized for use near electrical conductors.

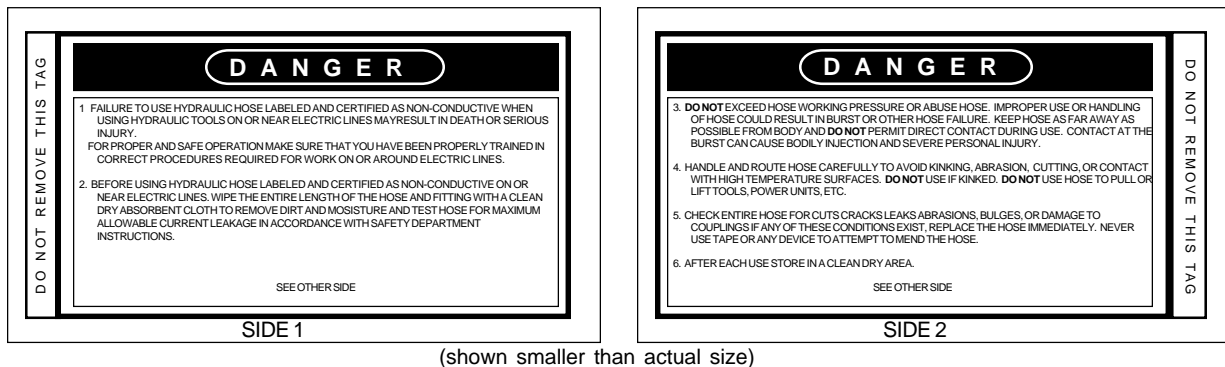
Hoses ② and ③ listed above are **conductive** and **must never** be used near electrical conductors.

HOSE SAFETY TAGS

To help ensure your safety, the following DANGER tags are attached to all hose purchased from Stanley Hydraulic Tools. **DO NOT REMOVE THESE TAGS.**

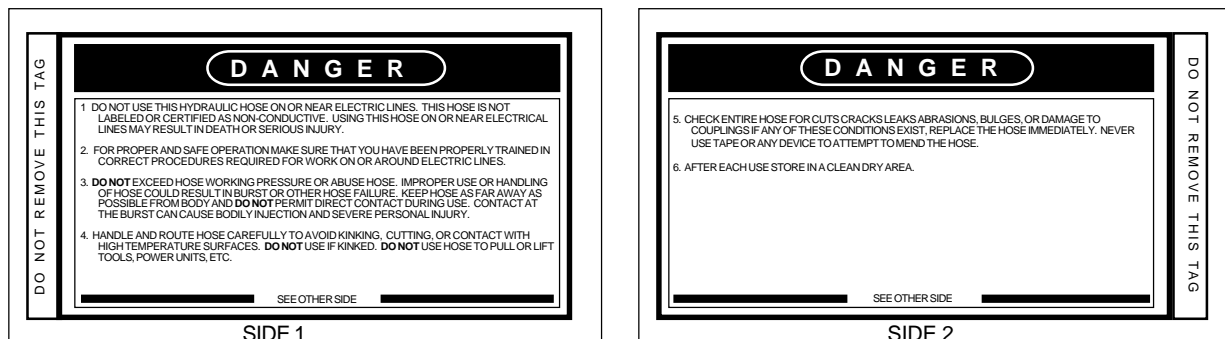
If the information on a tag is illegible because of wear or damage, replace the tag immediately. A new tag may be obtained from your Stanley Distributor.

THE TAG SHOWN BELOW IS ATTACHED TO "CERTIFIED NON-CONDUCTIVE" HOSE



(shown smaller than actual size)

THE TAG SHOWN BELOW IS ATTACHED TO "CONDUCTIVE" HOSE.



(shown smaller than actual size)

HOSE PRESSURE RATING

The rated working pressure of the hydraulic hose **must be equal to or higher than** the relief valve setting on the hydraulic system.

HTMA REQUIREMENTS

TOOL CATEGORY



HYDRAULIC SYSTEM REQUIREMENTS

TYPE I

TYPE II

TYPE III

TYPE RR

FLOW RATE	4-6 gpm (15-23 lpm)	7-9 gpm (26-34 lpm)	11-13 gpm (42-49 lpm)	9-10.5 gpm (34-40 lpm)
TOOL OPERATING PRESSURE (at the power supply outlet)	2000 psi (138 bar)	2000 psi (138 bar)	2000 psi (138 bar)	2000 psi (138 bar)
SYSTEM RELIEF VALVE SETTING (at the power supply outlet)	2100-2250 psi (145-155 bar)	2100-2250 psi (145-155 bar)	2100-2250 psi (145-155 bar)	2200-2300 psi (152-159 bar)
MAXIMUM BACK PRESSURE (at tool end of the return hose)	250 psi (17 bar)	250 psi (17 bar)	250 psi (17 bar)	250 psi (17 bar)
Measured at a max. fluid viscosity of: (at min. operating temperature)	400 ssu* (82 centistokes)	400 ssu* (82 centistokes)	400 ssu* (82 centistokes)	400 ssu* (82 centistokes)
TEMPERATURE Sufficient heat rejection capacity to limit max. fluid temperature to: (at max. expected ambient temperature)	140° F (60° C)	140° F (60° C)	140° F (60° C)	140° F (60° C)
Min. cooling capacity at a temperature difference of between ambient and fluid temps	3 hp (2.24 kW) 40° F (22° C)	5 hp (3.73 kW) 40° F (22° C)	7 hp (4.47 kW) 40° F (22° C)	6 hp (5.22 kW) 40° F (22° C)
NOTE: Do not operate the tool at oil temperatures above 140° F (60° C). Operation at higher temperatures can cause operator discomfort at the tool.				
FILTER Min. full-flow filtration Sized for flow of at least: (For cold temp. startup and max. dirt-holding capacity)	25 microns 30 gpm (114 lpm)	25 microns 30 gpm (114 lpm)	25 microns 30 gpm (114 lpm)	25 microns 30 gpm (114 lpm)
HYDRAULIC FLUID Petroleum based (premium grade, anti-wear, non-conductive) VISCOSITY (at min. and max. operating temps)	100-400 ssu*	100-400 ssu* (20-82 centistokes)	100-400 ssu*	100-400 ssu*
NOTE: When choosing hydraulic fluid, the expected oil temperature extremes that will be experienced in service determine the most suitable temperature viscosity characteristics. Hydraulic fluids with a viscosity index over 140 will meet the requirements over a wide range of operating temperatures.				

*SSU = Saybolt Seconds Universal

NOTE:

These are general hydraulic system requirements. See tool Specification page for tool specific requirements.

OPERATION

PREPARATION FOR USE

Do not operate the power unit until you have read the *engine* operating and maintenance instructions manual furnished with the unit.

1. ENGINE CRANKCASE OIL LEVEL

Always check the oil level before starting the engine. Make sure the oil level is at the FULL MARK on the dipstick. Do not overfill. Use diesel engine lube-oil to MIL-L-2104D with S.3 (MIL-L-45199B) detergent grade.

IMPORTANT

The engine oil sump must never be overfilled. Overfilling can cause the engine to overheat and cause crankshaft seal damage.

2. ENGINE FUEL LEVEL

Check the fuel level. If low, fill with DF-1 or DF-2 diesel fuel (A.S.T.M. D975-66T No. 1 or 2 dark).

WARNING

Shut the engine off before attempting to add fuel to the fuel tank. Do not remove the fuel cap while the engine is running. Do not add fuel to the tank while the engine is hot. Do not fill the fuel tank to a point of overflowing.

3. HYDRAULIC FLUID

Check the dip stick in the hydraulic fluid reservoir for the proper fluid level. Proper fluid level is indicated when the center section of the dipstick shows oil. If the center section of the dipstick does not show add hydraulic fluid.

NOTE:

Do not over fill the hydraulic tank. Oil will rise and leak from the tank breather.

Use fluids meeting the following specifications.

VISCOSITY (FLUID THICKNESS)

U.S. METRIC

50°F 450 SSU Maximum	10°C 95 C.S.
100°F 130-200 SSU	38°C 27-42 C.S.
140°F 85 SSU Minimum	60°C 16.5 C.S. Min

Pour Point -10°F/-23°C Minimum (for cold startup)

Viscosity Index (ASTM D-2220) 140 Minimum

Demulsibility (ASTM D-1401) 30 Minutes Maximum

Flash Point (ASTM D-92) 340°F/171°C Minimum

Rust Inhibition (ASTM D-665 A & B) Pass

Oxidation (ASTM D-943) 1000 Hours Minimum

Pump Wear Test (ASTM D-2882) 60 mg Maximum

The following fluids work well over a wide temperature range at startup. Allow moisture to settle out and resist biological growth that may occur in cool operating hydraulic circuits. These fluids are recommended by Stanley Hydraulic Tools. Other fluids that meet or exceed the specifications of these fluids may also be used.

Chevron AW-MV-32

Exxon "Univis" J-26

Mobil D.T.E. 13

Gulf "Harmony" AW-HVI-150-32

Shell "Tellus" T-32

Texaco "Rando" HD-AZ

Union "Unax" AW-WR-32

Terresolve EnviroLogic 132

4. HYDRAULIC CONNECTIONS

Facing the panel control valve, the far right-hand male quick disconnect fitting is the pressure (FLUID OUT) fitting. The left-hand female quick disconnect fitting is the return (FLUID IN) fitting.

The recommended hose length is 25 ft/8 m with a 1/2 inch/12.7 mm inside diameter. The hoses must have a working pressure rating of at least 2500 psi/175 bar. Each hose end must have male thread ends compatible with H.T.M.A. (HYDRAULIC TOOL MANUFAC-

OPERATION

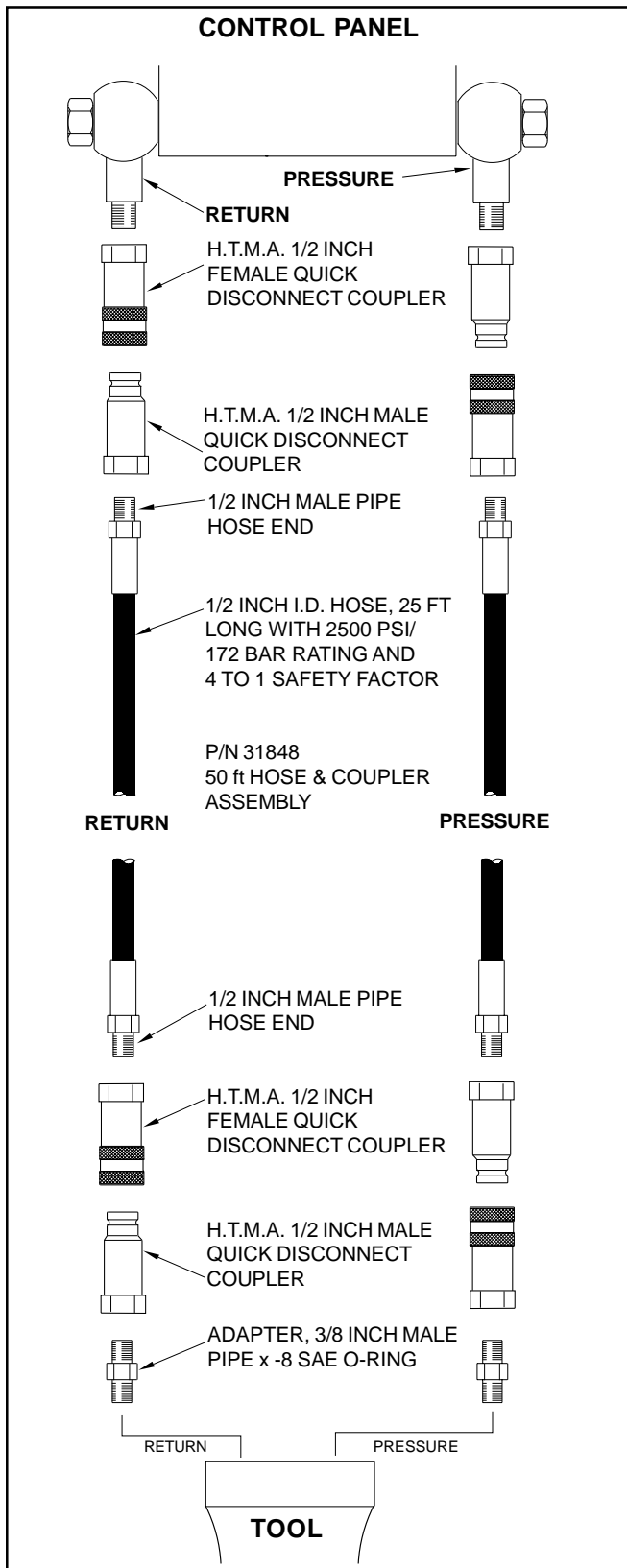


Figure 1. Hydraulic Connections

TURERS ASSOCIATION) quick disconnect fittings (NPT type threads). (See Figure 1.)

Longer hoses may be used when necessary, but can effect the operation of the engine automatic throttle due to fluid resistance in the hose. If small diameter or long hoses are used, or if restrictive fittings are connected to the supply and return ports, the pressure required to push the fluid through the system and back to the hydraulic tank will be higher. If the pressure is too high, this will cause the engine RPM to remain at full load if "AUTO" is selected on the automatic throttle. Also see "HYDRAULIC HOSE REQUIREMENTS" earlier in this manual.

QUICK DISCONNECT COUPLERS

H.T.M.A. approved quick disconnect couplings are installed to hydraulic hoses so that the direction of oil flow is always from the male to the female quick disconnect as shown in figure 1. Quick disconnect couplings and hose fittings are selected so that additional fittings such as reducer or adapter fittings are not required.

If adapter fittings are used, they must be approved steel hydraulic fittings meeting a minimum operating pressure rating of 2500 psi/172 bar. Do not use galvanized pipe fittings or black pipe fittings.

Use thread tape or pipe joint compound when installing quick disconnect couplings to hose or tool fittings. Follow the instructions furnished with the selected thread sealant. **DO NOT OVERTIGHTEN THE FITTINGS.**

5. BATTERY

The supplied 12 Volt DC no maintenance dry cell battery is fully charged.

The battery is air transportable and is suitable for cold weather applications. Make sure the battery cables are tight and charging circuit functions are operating properly.

NOTICE

Do not charge the battery with a standard automotive battery charger. This type of charger produces a charging amperage higher than 2 amps. Charging the battery at higher than 2 amps will damage the battery.

OPERATION

STARTUP

SEE "CONTROL PANEL" - FIGURE 2

1. Before starting the engine, assure the hydraulic circuit control lever is in the "TOOL OFF" position (left) and the throttle cable is fully depressed.



Figure 2. Control Panel

2. Turn the three-position starter switch clockwise until the engine begins to crank. When the engine starts, release the switch. The switch will default to the "ON" (2nd) position as shown in Figure 3.

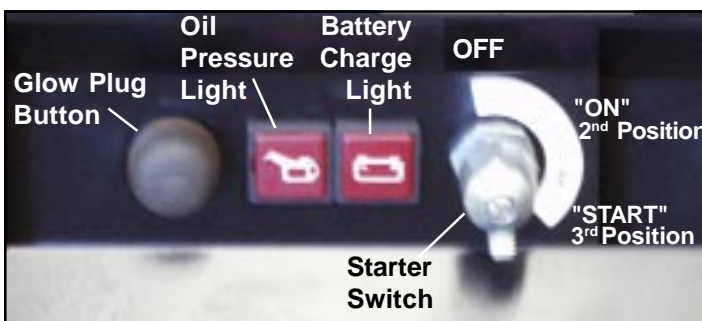


Figure 3. Engine Control Panel

3. When the engine is warmed up, pull the throttle cable to the full open position and lock it into place. This will provide the proper rpm to obtain 8 gpm / 30 lpm required to power the hydraulic tools.

4. Push the hydraulic tool circuit control lever to the "ON" position (right) (see Figure 4).

OIL PRESSURE LIGHT

A problem with the engine oil lubricating system exists if the oil pressure light remains on after the engine has started. Shutdown the engine and then have the lubricating system serviced by a qualified technician.

COLD WEATHER STARTUP

1. Before starting the engine, assure the hydraulic circuit control lever is in the "TOOL OFF" position (left) and the throttle cable is fully depressed.

2. Press and hold the glow plug switch for 10-15 seconds. Release the glow plug button and turn the start switch to the third start position to crank the engine.

NOTE:

Hydraulic fluids are thicker in cold weather. It is recommended that the engine be ran at low idle long enough to bring the fluid temperature up to a minimum of 50°F/ 10°C or until the top of the hydraulic filter feels warm.

3. When the engine is warmed up, pull the throttle cable to the full open position and lock it into place. This will provide the proper rpm to obtain 8 gpm required to power the hydraulic tools.

4. Push the hydraulic tool circuit control lever to the "ON" position (right) (see Figure 4).



Figure 4. Control Panel to "ON" Position

OPERATION

TOOL OPERATION

1. With the control lever at the "ON" position.
2. Activate the tool. The automatic throttle will increase engine speed to permit proper tool operation. When the tool is deactivated, the automatic throttle allows the engine to return to idle.

NOTE:

If the tools and tool hoses are cold, it is recommended to allow hydraulic fluid to circulate through the tool hoses until warm before using the tools.

SHUTDOWN

1. Place the circuit control lever in the "OFF" position.
2. Push the throttle control completely in. Allow the engine to idle for approximately one minute and then switch the starter switch to the "OFF" position.
3. Pull the engine "STOP" knob.

NOTE:

The starter switch must be turned to the "OFF" position. Failure to do so will cause battery failure.

USING THE HANDLE BARS

The power unit is equipped with retractable handle bars so it can easily be moved at the job site.

NOTICE

DO NOT lift the power unit with the handle bars extracted.

1. To use the handle bars, pull each handle bar straight out. Twist the bars until locking mechanism engages. The power unit may now be pushed about in a wheel-barrow manner.
2. To retract the handle bars, disengage the locking mechanism, then push the bars inward

NOTE:

Use the correct number of personnel to lift or hoist the HP18289M Power Unit to and from the trailer. The

power unit weighs 384 lbs. Using the extracted handle bars to lift the power unit will cause damage.

STORAGE

- Clean the unit thoroughly before storage. Do not use water pressure.
- Always store the unit in a clean and dry facility.
- If the unit will be stored for a prolonged period (over 30 days, up to 6 months), replace the fuel filter then add diesel fuel additive to the fuel tank to prevent the fuel from gumming. Be sure to follow the instructions provided with the fuel additive. Run engine for a short period to circulate the additive.
- Check hydraulic reservoir for water. If water is found, change the oil and circulate it through the tool hose and tool. (See "HYDRAULIC SYSTEM MAINTENANCE" earlier in this section).
- Disconnect tool hoses.

ROUTINE MAINTENANCE

ENGINE MAINTENANCE

Follow the maintenance schedule and general maintenance instructions in the engine maintenance and operation manual furnished with the power unit. Normal maintenance includes:

- Inspect the air filter daily. Clean foam air cleaner every 3 months or 50 hours at a minimum.
- Replace dry air filter every 200 hours of operation.
- Replace fuel filter every 100 hours of operation.
- Replace spark plugs every 300 hours or every year.
- Change engine oil after first 50 hours of operation, then after every 200 hours of operation. If engine has been operating under heavy load or in high ambient temperature, moist or dusty conditions then change the oil every 25 hours of operation.
- Change oil filter when engine oil is changed.
- Check oil level daily.
- Remove dirt and debris from engine with a cloth or brush daily. Do not use water spray.
- Clean air cooling system every 100 hours of operation.

HYDRAULIC SYSTEM MAINTENANCE

- Check hydraulic fluid level daily. Add fluid per specifications in this manual. (See "HYDRAULIC FLUID" under the section titled "OPERATING INSTRUCTIONS".
- Each day, check hydraulic lines and fittings for leaks, kinks, etc. Do not use your hand to perform this check.
- Change the hydraulic filter element every 200 hours of operation. Change more often if cold, moist or dusty conditions exist.
- Check oil cooler for debris. Remove debris with air pressure.
- Make sure the suction hose (from the hydraulic tank to the inlet manifold) is clamped securely. This reduces the risk of pump cavitation. All pump fittings should be tight.

- Keep air out of the hydraulic lines. Hydraulic system overheating and foam at the hydraulic tank breather indicates air is present in the lines. Keep all suction line fittings and clamps tight.

- Hydraulic system wear is noted by increased heat during tool operation, reduced tool performance and eventual system breakdown.

- Operate with the fluid temperature at 50° - 140°F / 10° - 60°C for improved seal and hose life, and maximum efficiency.

FILLING THE RESERVOIR

1. Make sure the engine is stopped before opening the filler cap. Fill slowly with the recommended fluid as listed in the "Operation" section of this manual.
2. Add fluid as needed.
3. Secure the filler cap before restarting the engine.

REMOVING CONDENSED MOISTURE FROM HYDRAULIC FLUID

Condensation is a frequent problem with cool hydraulic circuits. This condition occurs in moist or cold climates. When warm air in the hydraulic tank draws moisture from the cooler air outside, water accumulates in the tank.

1. To remove water from the hydraulic system, use the "PRESSURE" hose without the quick-disconnect coupler attached. Start the engine and let it run at the idle speed. Pump the fluid into a clean 5 gal./20 ltr container.
2. Turn the engine "OFF" as soon as the hydraulic tank (reservoir) is empty. DO NOT operate the engine with an empty hydraulic tank as pump damage may occur.
3. Allow the fluid to sit long enough for the water to settle to the bottom of the container. Slowly pour the fluid back into the hydraulic tank, avoiding the water at the bottom of the container.

TESTING & TROUBLESHOOTING

GENERAL

Tests and adjustments should be performed periodically to ensure the power unit is operating at maximum efficiency. Stanley Circuit Tester (Part Number 04182) is recommended. This tester can be used to isolate problems in both the engine and hydraulic system prior to any power unit disassembly.

TESTING THE HYDRAULIC CIRCUIT

The following tests can be performed to ensure that the hydraulic pump is supplying the correct flow and pressure and that the system relief valve is operating properly.

During these tests, make sure the engine is warm and operating smoothly. If test results are not as specified, refer to the troubleshooting table given in this section for possible causes.

TESTING THE 8 GPM CIRCUIT

To test the circuit, proceed as follows:

1. Set the Circuit Control Lever to the "OFF" position.
2. Connect the Stanley Circuit Tester across two hose ends (where the tool would normally be connected).
3. Fully open the tester restrictor valve (counter clockwise).
4. Start the engine and allow it to run until warm.
5. Pull the engine throttle control completely "OUT" so that the engine is running at full RPM.
6. Move the Circuit Control Lever to the "ON" position.
7. With the engine at high speed, the test flow gauge should read at least 8 gpm / 30 lpm.
8. Slowly turn the restrictor valve clockwise while watching the pressure gauge. The flow rate should stay at 8-9 gpm / 30-34 lpm as the pressure gauge reaches 2100-2200 psi / 148-155 bar.
9. At 2100-2200 psi/148-155 bar the relief valve should begin to open. The pressure at which the relief valve just begins to open is commonly referred to as the "cracking pressure". At the "cracking pressure", the flow rate should start to drop because the relief valve is allowing fluid to bypass to the hydraulic reservoir. The "cracking pressure" is preset at the factory and if it is not within the above range, the relief valve must be reset as follows:

a. Access to the relief valve can be gained through the top of the power unit between the dash panel and top grille. If more room is required, remove the dash panel. Use a open end or box end wrench to remove the cap on the relief valve.

b. Use an Allen wrench to adjust the relief valve. Turn clockwise to raise the pressure and counterclockwise to reduce the pressure.




c. Replace the cap and test for 2100-2200 psi/148-155 bar as described above.

d. Repeat the above test with the hoses and tester connected to the other circuit.

TROUBLESHOOTING

PROBLEM	CAUSE	REMEDY
Engine will not run.	Battery not connected.	Attach battery cables, check wires.
	Weak battery.	Test battery, charge or replace.
	No fuel.	Add Fuel.
	Fuel filter plugged.	Replace fuel filter.
Fluid blowing out of fluid reservoir vent.	Defective pump seal.	Replace pump seal.
	Hydraulic tank overfilled.	Correct the fluid level.
Hydraulic tool won't operate.	Control lever setting incorrect.	Set control lever to "TOOL ON".
	Incorrect hose connection to tool.	Make sure the tool hose goes from pressure fitting to tool and back to the return fitting. Fluid always flows from the male to female fittings.
	Quick disconnect fittings defective.	Detach from hose, connect set together and check for free flow.
	Hydraulic fluid level low.	Check for correct fluid level. Fill using the recommended fluid.
	Pump coupling defective.	Check coupling between pump and blower. The coupler should slide only .03-.06 in./ .80-1.60 mm inches between blower and pump.
	Relief valve stuck open.	Adjust or replace valve.
	Incorrect throttle setting	Pull throttle completely out so that engine runs at full rpm.

SPECIFICATIONS

Engine:	Duetz Ruggerini MD191, 2 cylinder, diesel, 19 hp
Engine Lube System:	Pressure Lube
Capacity	8 gpm @ 2000 psi / 30 lpm @ 138 bar
Length:	35.5 in. / 90 cm
Width:	24 in. / 61 cm
Height: (with hose basket)	39.5 in. / 100.3 cm
 Weight (Wet):	384 lbs / 174 kg
Fuel Tank Capacity:	4.2 gal. / 15 ltr
Estimated Gas Consumption Per Hour	1.3 gal / 4 ltr
Hydraulic Reservoir Capacity:	2.7 gal. / 11 ltr
Relief Valve "crack" setting	2150 psi / 148 bar
Full relief setting	2500 psi / 172 bar
 or  EHTMA Category	"C" (20 lpm @ 138 bar) or "D" (30 lpm @ 138 bar)
Sound Pressure Level @ 1 meter	100 dBA
Sound Power Level	111 dBA (LWA)
Vibration Level	N/A

ACCESSORIES

50 ft Dual Hydraulic Hose, 1/2 in. I.D., Wire Braid with Couplers	31848
25 ft Dual Hydraulic Hose, 1/2 in. I.D., Wire Braid with Couplers	31972
Flush-Face Coupler Set, 1/2 in. NPT, NSN 4730-01-479-0555	24070
Bruning Flush-Face Coupler Set, 1/2 in. NPT	03974
Flow and Pressure Tester	04182
Adaptor, 1/2 in. SAE to 3/8 in. Male Pipe	00936
Bushing, 1/2 in. to 3/4 in.	02151
Hex Nipple, 1/2 in. Male Pipe	04192
Hex Nipple, 3/8 in. Male Pipe	03044
MAAS TOOLS NSN'S	
Military Pavement Breaker (Stanley # Br6713016)	3820-012-421-440
Military Hammer Drill (Stanley # HD45110D)	5130-01-178-6338
MAAS Post Driver (Stanley # PD48142)	1710-01-468-8021
MAAS Post Puller (Stanley # PP10100A)	1710-01-468-8024
Hydraulic Power Unit (Gasoline Powered) (Stanley # HP18299M)	4320-01-450-3557
Hydraulic Power Unit (Diesel Powered) (Stanley # HP18289M)	1730-01-342-2183
50 ft Dual Hose Assembly, includes Couplers (Stanley # 31848)	4720-01-361-5033

SERVICE INSTRUCTIONS

GENERAL

Service instructions in this section are limited to parts and components other than the engine and hydraulic pump. Other major components should be serviced by representatives of the respective manufacturers as follows:

ENGINE

Duetz Ruggerini, 19 hp
Model: MD191

The engine should be serviced only by *Ruggerini Certified Dealers*. It is recommended to contact Deutz Corporation for the nearest authorized Ruggerini representative at 1-770-564-7100.

HYDRAULIC PUMP

Using the fittings or the wood dowels, plug one end of each of the short hoses.

c. Thoroughly clean the exterior of the connections of the fuel supply line (12, fig 6A) and the fuel return line (10, fig 6A) where they are connected to the fuel tank. Disconnect one fuel line at a time, quickly plugging the fuel line and the tank port with the wood dowels or fittings and the short hose lengths to minimize spillage. Wipe up any spillage using appropriate disposal methods.

Model HP18289M: The fuel tank must be removed in order to remove the engine.

a. Disconnect the hoses (13 & 14, fig 6A) and plug them with a plug fittings or wood dowels.

b. Remove the 3 capscrews (23, fig 2A) that secure the tank to the frame. Remove the fuel tank.

4. Remove the air cleaner cover and air cleaner.

5. Remove the top grille (8, fig 2 or 47, fig 2A).

6. Remove the fasteners that retain the cooler mounts (6 & 10, fig 1 & fig 1A) and the cooler brace (12, fig 1 and fig 1A) and remove the mounts and brace. The switch box (7, fig 1) and wiring will be loose after this procedure and can then be removed with the engine.

7. Tie the oil cooler (8, fig 1 and fig 1A) to the frame rails of the frame (55, fig 2 or 39 fig 2A) so that it will not interfere with removal of the engine.

8. Disconnect the two wires leading to the hour meter.

9. Disconnect the throttle cable (6, fig 2 or fig 2A) at the engine.

10. Using an Allen wrench, loosen the setscrews on the coupling assy (27 & 28, fig 2 or 16, fig 2A).

11. Unscrew and remove the nuts (37, fig 2 or 35, fig 2A) and capscrews (20, fig 1 & fig 1A) and washers.

12. Slide the engine forward being careful not to entangle the electrical wiring and not to damage other components.

13. Remove the coupling sleeve (28, fig 2 or 17, fig 2A).

14. Slide the engine out the fuel tank side of the frame.

ENGINE REMOVAL

Most engine servicing can be performed without removing the engine. Consult with your Ruggerini Dealer regarding engine repairs.

1. Remove both battery connections. Remove the battery strap or battery hold down. Remove the battery.

2. Remove the wheels by first removing one retaining ring, slide one washer and wheel off of the axle, then pull the other wheel and axle out of the axle brackets.

FUEL LINES AND FUEL TANK

3. Follow the applicable instructions below to disconnect engine fuel lines.

Model HP18289M: The hoses at the fuel tank must be disconnected. Obtain the following materials for plugging the fuel tank ports and the fuel hoses.

a. Two short lengths (2 to 3 inches) of fuel hose one with 1/4 inch inside diameter and one with 1/8 inch inside diameter.

b. Four plug fittings or wood dowels to plug one end of each of the short hoses and also the ends of the hoses disconnected from the fuel tank.

SERVICE

TO REINSTALL ENGINE

1. Reverse the above procedures to reinstall the engine.
2. Install the capscrews (20, fig 1 & fig 1A) so that one washer (21, fig 1A or 36 fig 1) is installed next to the head of the capscrew, one washer is installed between the engine mounting bracket and the frame and one washer is installed between the nut (37, fig 2 or 35, fig 2A) and the frame. Tighten the capscrews and nuts to 20 ft. lb torque.
3. After installing the engine, adjust the coupling sleeve as follows:
 - a. Move the coupling flange forward or backwards on the engine drive shaft until the drive shaft is recessed into the coupling flange bore .435 inches. Tighten the setscrews.
 - b. Adjust the coupling flange on the pump until the coupling sleeve has 1/32-1/16 inch end play.

BLOWER HUB, BLOWER WHEEL, INLET RING, & BLOWER HOUSING

1. Remove the engine as described earlier in this section.
2. To remove the blower wheel, remove the five screws (31, fig 1 or fig 1A) around the housing inlet ring (30, fig 1 or 1A) and remove the ring.
3. Remove the blower wheel (26, fig 1 or 24, fig 1A) with the blower hub (it may be required to remove the three hub screws and use them as jack screws in the adjacent holes) (25, fig 1 or 1A) by loosening the set screws on the coupler flange (28, fig 1 or 1A).
4. Remove the four capscrews (14, fig 1 or 1A) holding the blower housing (16, fig 1 or 1A) to the engine. Remove the housing.

RE-ASSEMBLY

1. Reverse the above procedure to reinstall the above components and observe the following added procedures.
 - a. Install capscrews which hold the blower housing to the engine using Loctite™ 242.
 - b. Install capscrews which hold the blower wheel to the blower hub using Loctite™ 680 and torque to 80-100 lb. in.

OIL COOLER

1. Remove the top grille (8, fig 2 or 47, fig 2A).
2. Remove the hoses (3 & 9, fig 6 or 6A).
3. Remove the fasteners that retain the cooler mounts (6 & 10, fig 1 or 1A) and the cooler brace (12, fig 1 or 1A) and remove the mounts and brace. The switch box (7, fig 1) and wiring will be loose after this procedure.
4. Lift the cooler out.

RE-ASSEMBLY

1. Reverse the above procedure to reinstall the cooler.

HYDRAULIC PUMP

1. First remove the hydraulic fluid from the tank by either pumping it out with a portable drill pump or draining it into a container.
2. Remove the grille (19, fig 2 or 5, fig 2A).
3. Disconnect the pressure hoses and inlet manifold at the pump.
3. Remove the 2 capscrews (21, fig 2 or 10, fig 2A) and then remove the pump.

RE-ASSEMBLY

1. Reverse the above procedure to reinstall the pump and observe the following step.
 - a. Insure the coupling sleeve is installed correctly (see REINSTALL ENGINE).

FUEL TANK

1. If the fuel tank contains fuel, take extreme precautions to remove the fuel into approved containers. Do not attempt to service the fuel tank in unventilated areas or in areas containing electric or natural gas appliances which may start-up unexpectedly or in shop areas where grinding or welding is present, all of which can ignite the fuel vapors.

SERVICE

2. Follow step 3 under "ENGINE REMOVAL" to disconnect and plug the fuel lines.

To remove the tank, first remove the 3 capscrews (23, fig 2A) and tank support (37, fig 2A) at the top of the fuel tank only. Slide the tank out.

RE-ASSEMBLY

1. Reverse the above procedures to reinstall the fuel tank.

HYDRAULIC TANK

1. First remove the hydraulic fluid from the tank by either pumping it out with a portable drill pump or draining it into a container.

2. Remove the grille (19, fig. 2 or 5, fig 2A) by removing the 4 capscrews (9, fig. 2 or 3, fig 2A).

3. Remove the hoses (6 & 9, fig 6 or 6A) by loosening the hose clamps.

4. The hydraulic tank can now be removed by removing the 2 capscrews (32, fig. 2 or 23, fig 2A) and the tank support tab (29, fig 2 or 26, fig 2A).

5. On model HP18289M, the filter assembly (5, fig 4A) is removed by first removing the capscrews (8 fig 4A). Hold the grip plate in place with your fingers to prevent it from falling into the tank. For the model HP20271A, the filter assembly is removed by first removing the breather and the dipstick bolt (12, fig 4A).

RE-ASSEMBLY

1. Reinstall the components and complete assembly to the frame by reversing the above procedures.

DASH PANEL & VALVE ASSY

1. If it is necessary to remove the valve assembly, the battery must first be removed in order to gain access to the hose fittings and wiring located on the back of the panel.

2. After the hoses are removed, the valve assembly may be

removed by first removing the capscrews (15, fig 2 or 3, fig 2A and 27, fig 5A). Then remove the capscrews (19, fig 5A) holding the valve to the dash panel.

VALVE SPOOL

1. To remove the valve spool, remove the retaining rings (6, fig 5A) and pull the valve spool out of the valve body.

2. Inspect the finish of the valve spool and bores of the valve block. If scored or scratched, replace the part(s).

RELIEF VALVES

DESCRIPTION: The relief valves allow oil to by-pass to the reservoir when the system pressure reaches a pre-set value. The relief valves are set to by-pass at a "cracking" pressure of 2100-2200 psi/148-155 bar.

While adjustments can be made to the relief settings (see TESTING and TROUBLESHOOTING), the parts of the relief valves are not serviceable.

RE-ASSEMBLY

1. Reverse the above procedure to reinstall the above components.

TESTING

GENERAL

Tests and adjustments should be performed periodically to ensure the power unit is operating at maximum efficiency. A hydraulic circuit tester is recommended for use in isolating problems in both the engine and hydraulic system prior to any power unit disassembly.

TESTING THE HYDRAULIC CIRCUIT

The following tests can be performed to ensure that the hydraulic pump is supplying the correct flow and pressure and that the system relief valve is operating properly. During these tests, make sure the engine is warm and operating smoothly. If test results are not as specified, refer to the troubleshooting table given in this section for possible causes. Also, refer to the section on service instructions for repair or replacement of defective parts.

TESTING H.T.M.A. (Hydraulic Tool Manufacturers Association) TYPE II CIRCUITS.

An **H.T.M.A. Type II Circuit** is a circuit that produces 8 gpm/30 lpm at 2000 psi/138 bar. When the throttle actuator is set in the full open position, the power unit produces 8 gpm/30 lpm at 2000 psi/138 bar.

1. Set the circuit control lever to the OFF position.
2. Connect the circuit tester across the tool hose ends.
3. Fully open the tester restrictor valve.
4. Start the engine and allow it to run until warm.
5. Set the engine Throttle Control to the full open position.
6. Place the circuit control lever to the ON position. With the engine at high speed, the test flow gauge should read 8-9 gpm/30-34 lpm.
7. Slowly close the restrictor valve while watching the pressure gauge. The flow rate should begin at 8 gpm/30 lpm and will drop slightly as the pressure gauge rises. At a pressure of 2000 psi/138 bar the flow rate should read 8 gpm/30 lpm. If it does not, the throttle governor may require adjustment. If a pressure of 2000 psi/138 bar cannot be obtained, the relief valve may require adjustment.

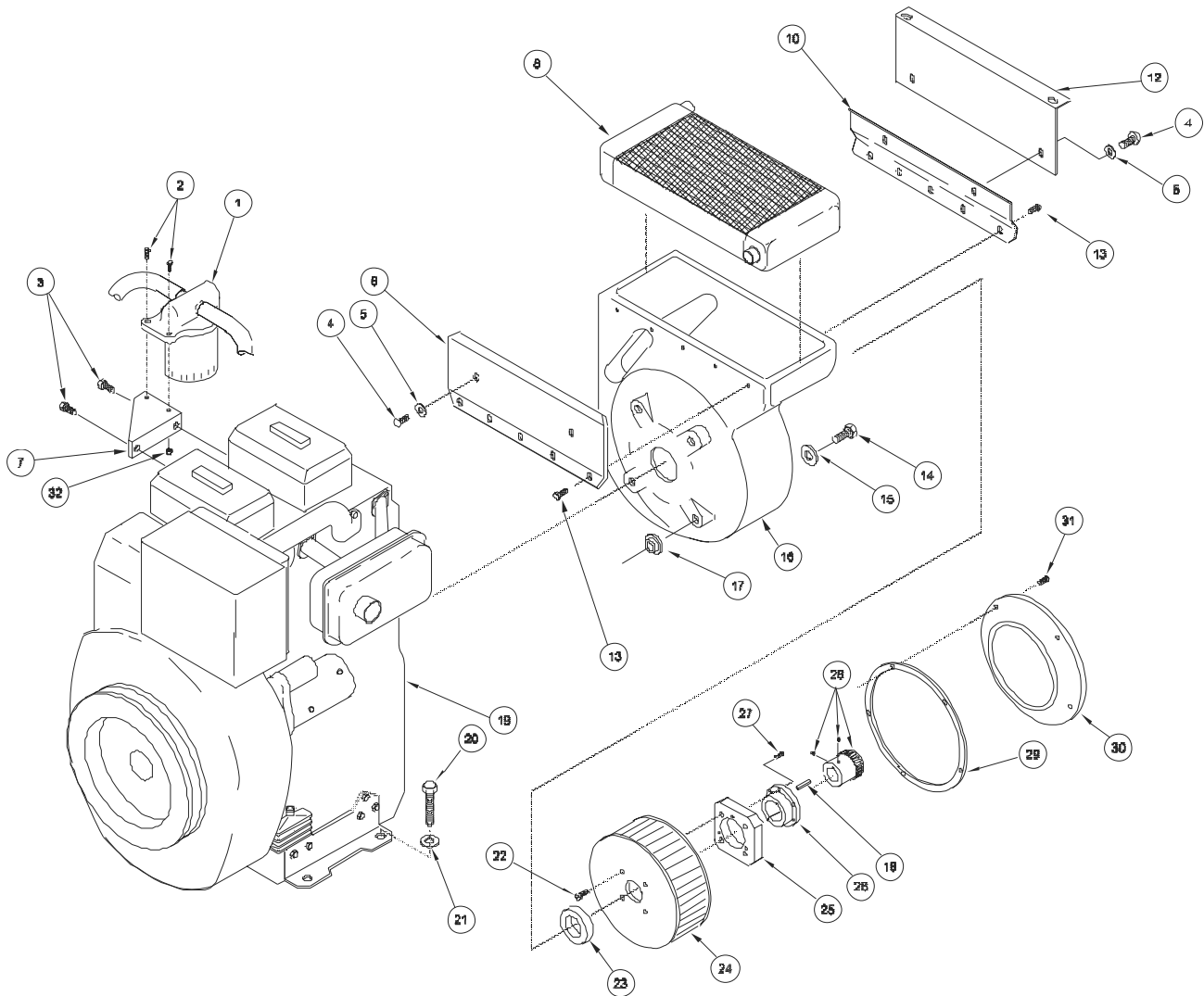
Test the relief valve according to the instructions located later in this manual.

TESTING & SETTING THE RELIEF VALVE

The relief valve is set to "crack" open at approximately 2100-2300 psi/145-158 bar and should be fully open at 2500 psi/172 bar. These settings are tested as follows:

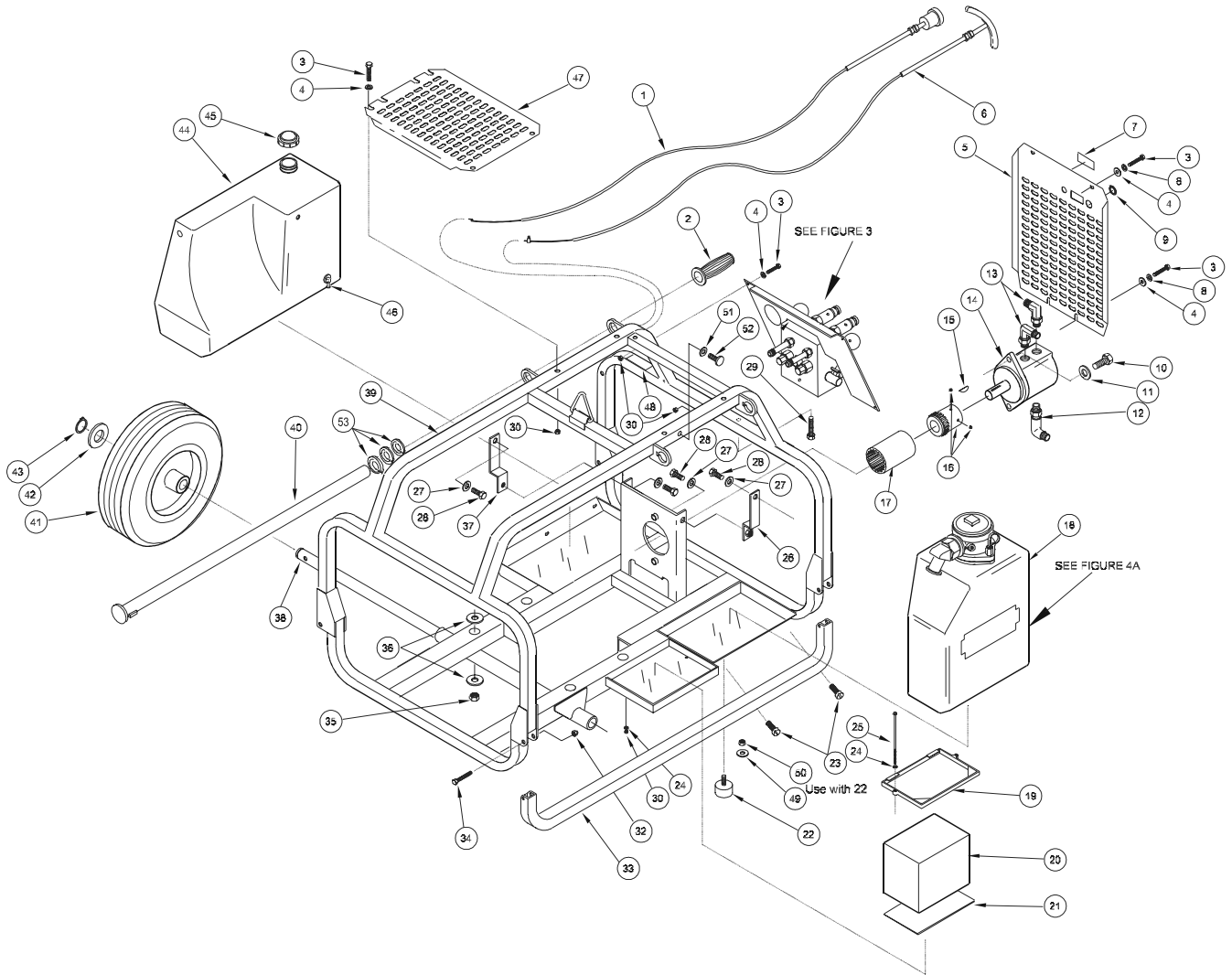
1. Set the circuit control lever to the OFF position.
2. Connect the circuit tester across the tool hose ends.
3. Fully open the tester restrictor valve.
4. Start the engine and allow it to run until warm.
5. Set the engine Throttle Control to the FULL OPEN position.
6. Place the circuit control lever to the ON position.
7. Slowly close the restrictor valve while watching the pressure gauge. When the gauge reaches 2000 psi, continue to close the restrictor and watch closely for a small drop in pressure. This small drop in pressure should occur between 2100-2300 psi/145-158 bar and indicates the pressure at which the relief valve "cracks" open. Continue to close the restrictor. The pressure should not exceed 2500 psi/172 bar when the restrictor is fully closed. If the above settings are incorrect, the relief valve requires adjustment or replacement as follows:
 - a. Remove the top grille.
 - b. Remove the capscrews holding the dash panel in place and tilt the dash panel forward to gain access to the relief valve.
 - c. Remove the cap to the relief valve and note the screw slot. The relief valve is adjusted by turning the screw clockwise to increase pressure or counter-clockwise to decrease pressure. Adjust the relief valve until a cracking pressure of approximately 2100-2300 psi/145-158 bar is achieved and then repeat the test.
 - d. If "cracking" pressure between 2100-2300 psi/145-158 bar cannot be achieved, and/or if a maximum pressure of 2500 psi/172 bar cannot be achieved, replace the relief valve and repeat the test.

FIGURE 1A ENGINE & BLOWER PARTS



ITEM	P/N	QTY	DESCRIPTION	ITEM	P/N	QTY	DESCRIPTION
1	----	1	Filter Bracket (Supplied with Item 19)	17	21681	4	Spacer
2	370508	3	Capscrew	18	07818	1	Square Key
3	----	2	Capscrew (Supplied with Item 19)	19	56641	1	Engine, Ruggerini MD191
4	31241	7	Capscrew	20	14876	4	Capscrew
5	03031	11	Lock Washer	21	04585	22	Washer (also used in Fig 2)
6	40053	1	Cooler Mount	22	32232	4	Capscrew
7	56670	1	Fuel Filter Bracket	23	38878	1	Spacer
8	40078	1	Oil Cooler	24	56640	1	Blower Wheel
9	----	--	NO ITEM	25	38877	1	Blower Hub
10	40054	1	Cooler Mount	26	39057	1	QD Bushing
11	----	--	NO ITEM	27	----	4	Capscrew (Supplied with Item 26)
12	56637	1	Cooler Brace	28	21687	1	Coupling Assy
13	08668	10	Sheet Metal Screw	29	08669	1	Inlet Ring Gasket
14	02474	4	Capscrew	30	56691	1	Inlet Ring
15	02477	8	Washer	31	08667	5	Tapping Screw
16	07783	1	Blower Housing	32	03906	9	ESNA Nut (also used in Fig 2)

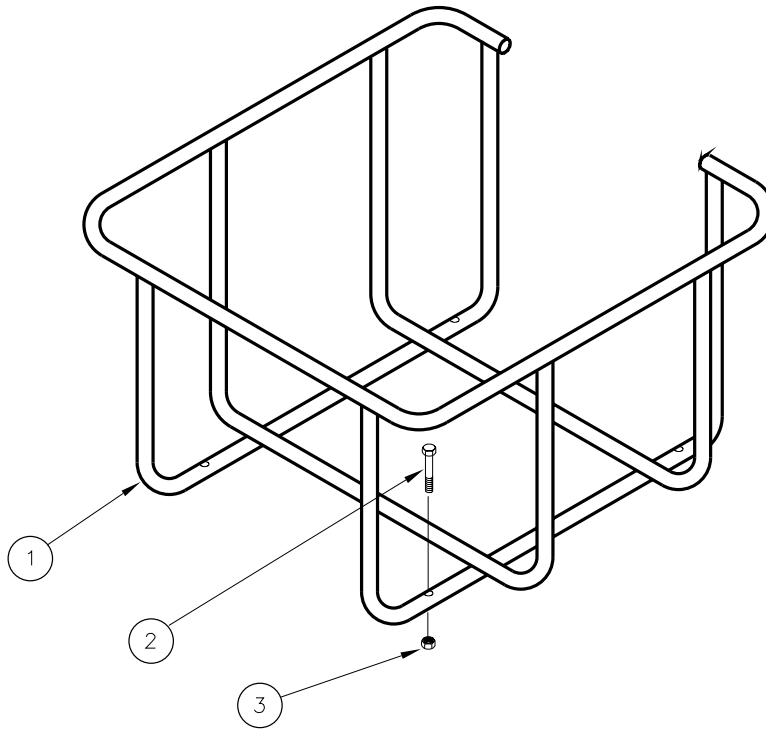
FIGURE 2A FRAME PARTS



ITEM	P/N	QTY	DESCRIPTION	ITEM	P/N	QTY	DESCRIPTION	ITEM	P/N	QTY	DESCRIPTION
1	56634	1	Stop Cable	20	59136	1	Battery	37	56645	1	Tank Support
2	08080	2	Handle Grip	21	10499	1	Battery Pad	38	59137	1	Axle
3	21319	11	Capscrew	22	21713	2	Vibration Mount	39	56619	1	Frame Weldment
4	04539	9	Washer	23	31241	5	Capscrew	40	56676	2	Handle Tube
5	60802	1	Grille Assy	24	04539	4	Washer	41	56633	2	Wheel, Foam Filled
6	21715	1	Throttle Cable	25	56671	2	Capscrew	42	21318	2	Washer
7	29133	1	Warning Sticker	26	56644	1	Tank Support	43	31240	2	Retaining Ring
8	01298	6	Lockwasher	27	03031	10	Washer	44	56635	1	Fuel Tank
9	56672	1	Plug	28	04416	3	Capscrew	45	56636	1	Fuel Tank Cap
10	02116	2	Capscrew	29	21319	1	Capscrew	46	-----	--	Supplied with Item 44
11	01459	2	Lock Washer	30	00719	12	Locknut	47	27759	1	Top Grille
12	04321	1	Elbow, 90°	31	-----	--	NO ITEM	48	35686	1	Decal, Hyd. Fluid
13	05967	1	Elbow, 90°	32	03906	9	ESNA Nut	49	04585	2	Washer
14	04134	1	Hydraulic Pump	33	31699	2	Carry Handle	50	00147	2	Nut
15	-----	1	Key (Included with pump)	34	370513	6	Capscrew	51	26831	4	Washer
16	21687	1	Coupling Assy (Incl items 17)	35	04353	12	Locknut	52	21714	2	Bumper
17	-----	1	Part of Item 16	36	04585	22	Washer (also used in Fig 1)	53	60773	6	Grommet
18	58650	1	Hydraulic Tank								
19	59139	1	Battery Hold Down								

FIGURE 3A

HOSE BASKET



ITEM	P/N	QTY	DESCRIPTION
1	10939	1	Hose Basket
2	16251	6	Capscrew
3	00719	6	Nut (also used in Fig 2)

FIGURE 4A HYDRAULIC TANK PARTS

ITEM	P/N	QTY	DESCRIPTION
	52754	1	Hydraulic Tank Kit
1	52774	1	Lid
2	52775	1	Spring
3	01202	1	O-Ring
4	40408	1	Filter Element
	40080	1	Filter Assy (Incl items 1-5 & 11-13)
5	58487	1	Filter Bowl
6	26070	1	Breather Vent
7	40364	1	Elbow, 45°
8	43688	1	Capscrew
9	58650	1	Tank
10	40133	1	Grip Plate
11	52782	1	Gasket
12	52773	1	Dipstick Bolt
13	52772	1	Dipstick
14	04306	1	Hose
15	58486	1	Filter Head
16	03044	1	Nipple
17	58460	1	Coupling
18	58489	1	Plastic Washer
19	04889	1	Hose Clamp
20	01258	1	O-Ring

SERVICE KIT P/N 43592		
03652	1	Lid
	1	O-Ring
	1	Filter Receptacle
	1	O-Ring
	1	Breather Element
	1	Breather Cover

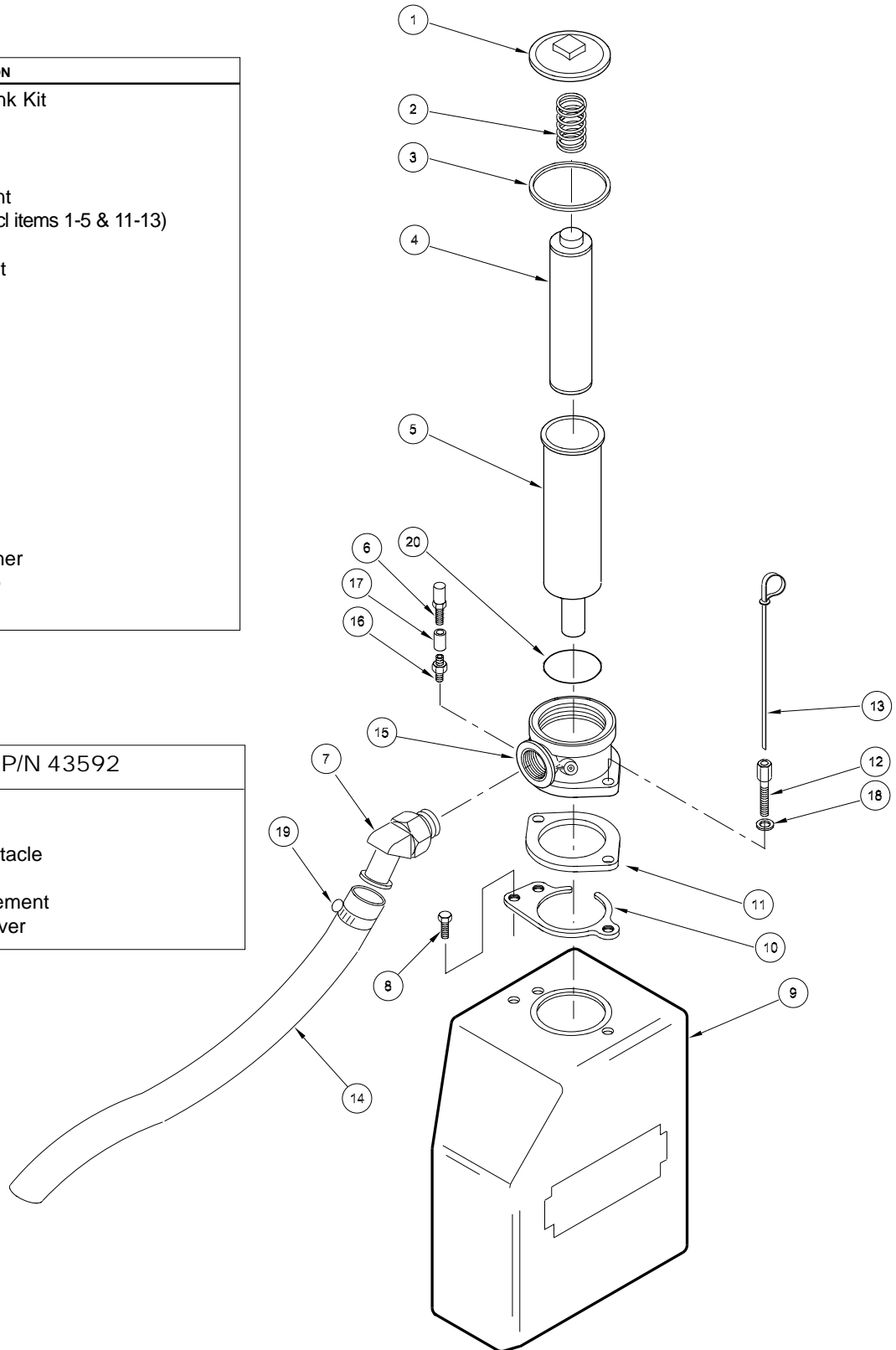
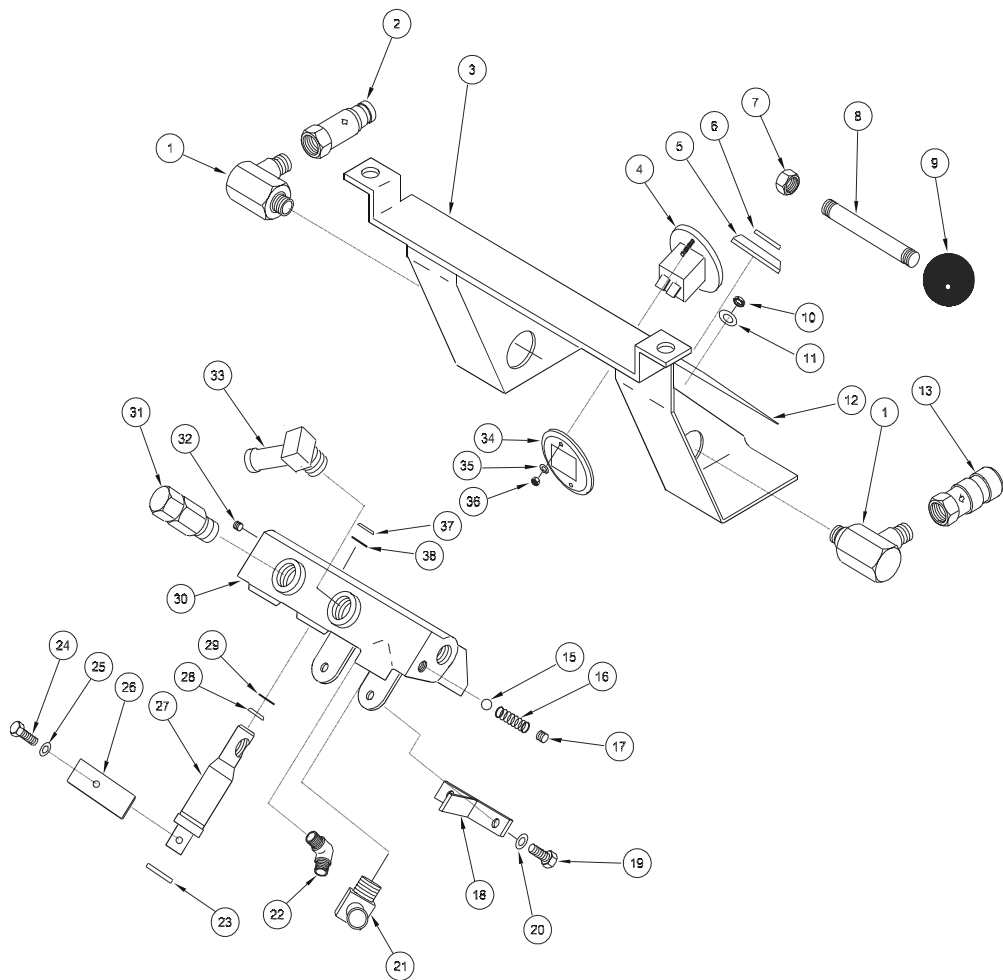
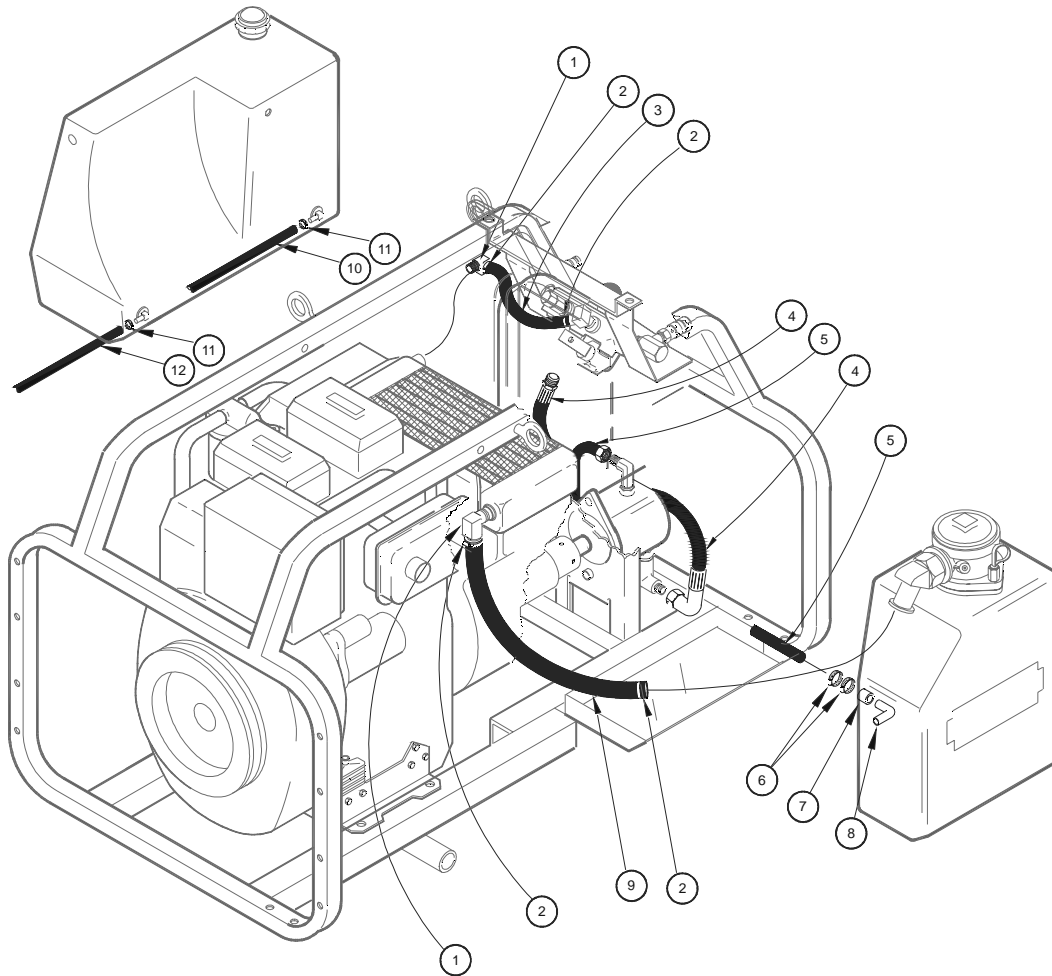


FIGURE 5A DASH PANEL & VALVE ASSEMBLY



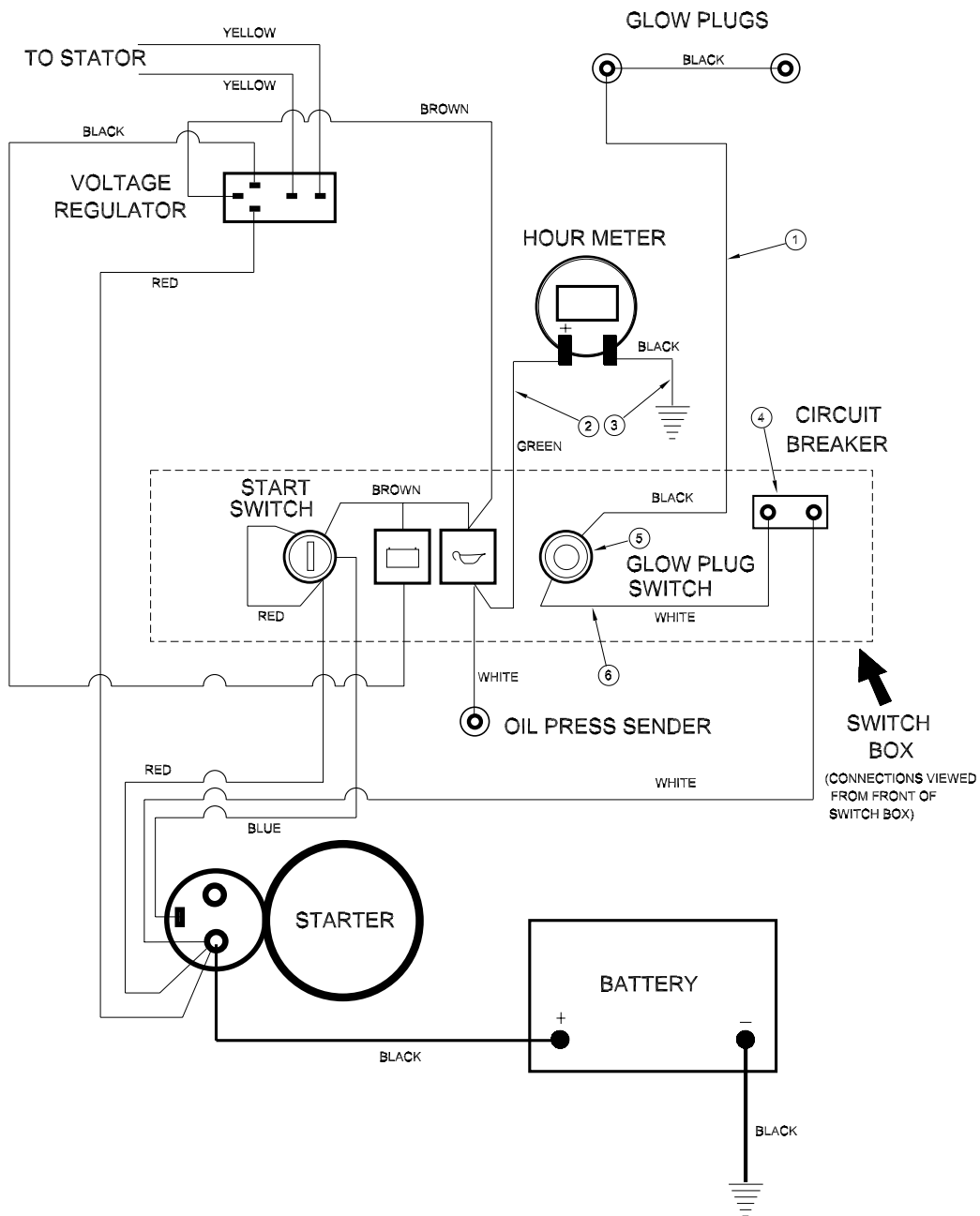
ITEM	P/N	QTY	DESCRIPTION	ITEM	P/N	QTY	DESCRIPTION
1	25633	2	Swivel Fitting	23	07745	1	Spool Stop Washer
2	24061	2	Male Coupler Body, 1/2 in.	24	05551	1	Capscrew
3	08425	1	Dash Panel (Incl item 12)	25	01459	3	Lockwasher
4	20606	1	Hour Meter	26	07753	1	Bar
5	07745	1	Spool Washer	27	07771	1	Valve Spool
6	07820	1	Retaining Ring	28	06988	1	Backup Ring
7	00147	1	Nut	29	06989	1	O-Ring
8	24291	1	Control Rod	30	07781	1	Valve Block
9	02633	1	On/Off Knob	31	05043	2	Relief Valve
10	-	1	Incl. with Item 14	32	00955	1	Pipe Plug
11	-	1	Incl. with Item 14	33	04868	1	Elbow Fitting, 90°
12	21698	1	Control Panel Decal	34	-	1	Incl. with Item 4
13	24060	2	Femal Coupler Body	35	-	2	Incl. with Item 4
14	-	-	No Item	36	-	1	Incl. with Item 4
15	07793	1	Steel Ball	37	01403	1	O-Ring
16	07754	1	Spring	38	07794	1	Backup Ring
17	01212	2	Pipe Plug	39	00140	1	Quad Ring
18	21693	1	Control Valve Stop				
19	27931	2	Capscrew				
20	01298	6	Lockwasher				
21	07792	1	Elbow Fitting, 45°				
22	01539	1	Elbow Fitting				

FIGURE 6A HOSES, FITTINGS & CLAMPS



ITEM	P/N	QTY	DESCRIPTION
1	07821	2	90° Elbow
2	04889	4	Hose Clamp
3	35220	1	Hose, Cooler Supply
4	34654	1	Hose Assy
5	21690	2	Hose, Suction
6	11179	4	Hose Clamp
7	07747	1	Sleeve, Suction
8	07749	1	Tube, Suction
9	04306	1	Hose, Cooler Return
10	56696	2	Hose, Fuel Return
11	04317	4	Hose Clamp
12	04308	1	Hose, Fuel Supply

FIGURE 7A WIRING DIAGRAM



ITEM	P/N	QTY	DESCRIPTION
1	59143	1	Wire Assy, Black
2	23683	1	Wire Assy, Green
3	08724	1	Wire Assy, Black
4	60930	1	Circuit Breaker
5	21775	1	Glow Plug Switch
6	59141	1	Wire Assy, White

WARRANTY

Stanley Hydraulic Tools (hereinafter called "Stanley"), subject to the exceptions contained below, warrants new hydraulic tools for a period of one year from the date of sale to the first retail purchaser, or for a period of 2 years from the shipping date from Stanley, whichever period expires first, to be free of defects in material and/or workmanship at the time of delivery, and will, at its option, repair or replace any tool or part of a tool, or new part, which is found upon examination by a Stanley authorized service outlet or by Stanley's factory in Milwaukie, Oregon to be DEFECTIVE IN MATERIAL AND/OR WORKMANSHIP.

EXCEPTIONS FROM WARRANTY

NEW PARTS: New parts which are obtained individually are warranted, subject to the exceptions herein, to be free of defects in material and/or workmanship at the time of delivery and for a period of 6 months after the date of first usage. Seals and diaphragms are warranted to be free of defects in material and/or workmanship at the time of delivery and for a period of 6 months after the date of first usage or 2 years after the date of delivery, whichever period expires first. Warranty for new parts is limited to replacement of defective parts only. Labor is not covered.

FREIGHT COSTS: Freight costs to return parts to Stanley, if requested by Stanley for the purpose of evaluating a warranty claim for warranty credit, are covered under this policy if the claimed part or parts are approved for warranty credit. Freight costs for any part or parts which are not approved for warranty credit will be the responsibility of the individual.

SEALS & DIAPHRAGMS: Seals and diaphragms installed in new tools are warranted to be free of defects in material and/or workmanship for a period of 6 months after the date of first usage, or for a period of 2 years from the shipping date from Stanley, whichever period expires first.

CUTTING ACCESSORIES: Cutting accessories such as breaker tool bits are warranted to be free of defects in material and or workmanship at the time of delivery only.

ITEMS PRODUCED BY OTHER MANUFACTURERS: Components which are not manufactured by Stanley and are warranted by their respective manufacturers.

- a. Costs incurred to remove a Stanley manufactured component in order to service an item manufactured by other manufacturers.

ALTERATIONS & MODIFICATIONS: Alterations or modifications to any tool or part. All obligations under this warranty shall be terminated if the new tool or part is altered or modified in any way.

NORMAL WEAR: any failure or performance deficiency attributable to normal wear and tear such as tool bushings, retaining pins, wear plates, bumpers, retaining rings and plugs, rubber bushings, recoil springs, etc.

INCIDENTAL/CONSEQUENTIAL DAMAGES: To the fullest extent permitted by applicable law, in no event will STANLEY be liable for any incidental, consequential or special damages and/or expenses.

FREIGHT DAMAGE: Damage caused by improper storage or freight handling.

LOSS TIME: Loss of operating time to the user while the tool(s) is out of service.

IMPROPER OPERATION: Any failure or performance deficiency attributable to a failure to follow the guidelines and/or procedures as outlined in the tool's operation and maintenance manual.

MAINTENANCE: Any failure or performance deficiency attributable to not maintaining the tool(s) in good operating condition as outlined in the Operation and Maintenance Manual.

HYDRAULIC PRESSURE & FLOW, HEAT, TYPE OF FLUID: Any failure or performance deficiency attributable to excess hydraulic pressure, excess hydraulic back-pressure, excess hydraulic flow, excessive heat, or incorrect hydraulic fluid.

REPAIRS OR ALTERATIONS: Any failure or performance deficiency attributable to repairs by anyone which in Stanley's sole judgement caused or contributed to the failure or deficiency.

MIS-APPLICATION: Any failure or performance deficiency attributable to mis-application. "Mis-application" is defined as usage of products for which they were not originally intended or usage of products in such a manner which exposes them to abuse or accident, without first obtaining the written consent of Stanley. PERMISSION TO APPLY ANY PRODUCT FOR WHICH IT WAS NOT ORIGINALLY INTENDED CAN ONLY BE OBTAINED FROM STANLEY ENGINEERING.

WARRANTY REGISTRATION: STANLEY ASSUMES NO LIABILITY FOR WARRANTY CLAIMS SUBMITTED FOR WHICH NO TOOL REGISTRATION IS ON RECORD. In the event a warranty claim is submitted and no tool registration is on record, no warranty credit will be issued without first receiving documentation which proves the sale of the tool or the tools' first date of usage. The term "DOCUMENTATION" as used in this paragraph is defined as a bill of sale, or letter of intent from the first retail customer. A WARRANTY REGISTRATION FORM THAT IS NOT ALSO ON RECORD WITH STANLEY WILL NOT BE ACCEPTED AS "DOCUMENTATION".

NO ADDITIONAL WARRANTIES OR REPRESENTATIONS

This limited warranty and the obligation of Stanley thereunder is in lieu of all other warranties, expressed or implied including merchantability or fitness for a particular purpose except for that provided herein. There is no other warranty. This warranty gives the purchaser specific legal rights and other rights may be available which might vary depending upon applicable law.



Stanely Hydraulic Tools
3810 SE Naef Road
Milwaukie, Oregon
503-659-5660 / Fax 503-652-1780
www.stanley-hydraulic-tools.com
