



Hydraulic Power Unit **PS-20HC**

OPERATORS MANUAL
WITH MAINTENANCE AND PARTS INFORMATION

1.800.227.7515
LITTLEBEAVER.COM



LITTLE BEAVER®
EARTH DRILLS & AUGERS

MFG BY: Little Beaver, Inc. 0318

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littlebeaver.com sales@littlebeaver.com

CUSTOMER SERVICE

Ph: 800/227-7515 or 936/327-3121 or Fax 936/327-4025

ORDERS...

Place your orders by telephone, fax, or mail. When calling, please have your parts manual handy for reference. Our hours are 8:00 am - 4:30 pm central time, Monday thru Friday. When ordering by mail or fax, include a description and LITTLE BEAVER part number for the items you are ordering, your return address, and payment or your authorization for COD shipment.

All orders are shipped UPS where possible. Freight charges will be added to your invoice. Some items are oversize, resulting in a higher shipping cost. Power units and larger augers are shipped via motor freight due to their weight.

PAYMENT TERMS...

COD, Cash in Advance, Visa, Mastercard or NET 30 with approved credit. COD limit for new accounts is \$500.00. Personal or company checks on new accounts will be held until they clear the bank. To eliminate this delay, you may pay by wire transfer or send a certified or cashiers check. For a NET 30 open account, please call or write for a credit application.

SERVICE AND REPAIR...

Your LITTLE BEAVER Hydraulic Power Unit has been designed for user repair with ordinary hand tools. No special tools are required. Consult the appropriate section of the parts manual for instructions.

Service or technical consultation is available, free of charge, from the factory in Livingston, Texas. We will be pleased to help you with any problems or questions. Just write, fax, or call. Our hours are 8:00am - 4:30pm central time, Monday thru Friday.

Factory repair is available. If you return a part to the factory, please include the following information: Your name and return address, a description of the problem and payment or authorization to return the repaired item COD for the repair and shipping charges.

RETURNS...

Please call the factory for a return authorization. This will help to ensure that your parts are handled properly. Include your name and address, customer account #, invoice # under which the returned parts were ordered, and a brief description of the problem with the parts or the reason for returning them. Parts to be considered for warranty must be returned to the factory for inspection within 10 days after receipt of replacement parts. Be sure to prepay the shipping charges, we will not accept collect or COD packages.

Our mailing address...


LITTLE BEAVER, Inc.
P. O. Box 840
Livingston, Texas 77351



SAFETY ALERT SYMBOL 

The symbol shown above is used to call your attention to instructions concerning your personal safety. **WATCH THIS SYMBOL** — It points out important safety precautions. It means — **ATTENTION! BECOME ALERT! YOUR PERSONAL SAFETY IS INVOLVED!**

Read the message that follows and be alert to the possibility of *Personal Injury or Death!*

 WARNING: The Engine Exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

1 YEAR LIMITED WARRANTY

For 1 year from purchase, LITTLE BEAVER, INC. will replace for the original purchaser, free of charge, any part or parts, found upon examination by any factory authorized service center, or by the factory at Livingston, Texas, to be defective in material or workmanship or both. If your equipment can not be repaired, it will be replaced. All transportation charges on parts submitted for replacement under this warranty must be borne by purchaser.

There is no other express warranty.

Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to 1 year from purchase and to the extent permitted by law. Any and all implied warranties are excluded. This is the exclusive remedy and liability for consequential damages under any and all warranties are excluded to the extent exclusion is permitted by law.

*Notice: Engines are warrantied by the manufacturer of the engine. See separate engine warranty enclosed.

MACHINE SERIAL NUMBER

The machine serial number for your Hydraulic Power Unit is located on the front plate of the frame. For your convenience, when requiring service or parts information, refer to this number and your model number. Record the model number, engine make, machine serial number and date of purchase in the space provided below:

MODEL NUMBER _____ ENGINE MAKE _____

MACHINE SERIAL NUMBER _____ DATE OF PURCHASE _____



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PARTS MANUAL

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SAFETY INSTRUCTIONS



WARNING: Failure to observe safety instructions and reasonable safety practices can cause Property Damage, Serious Bodily Injury and/or Death. **BE CAREFUL!! WATCH OUT FOR BYSTANDERS!!**



DANGER: NEVER run engine inside building or enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison.



DANGER: NEVER drill holes where there is a possibility of underground power cables or other hazards. The exact location of underground services must be determined prior to drilling. Inadvertent severing of telephone, fiber optic or CATV transmission cable, or damage to sewer pipe is costly; **RUPTURING OF GAS OR WATER LINES CAN CAUSE SERIOUS BODILY INJURY AND/OR DEATH. COMING INTO CONTACT WITH BURIED POWER LINES CAN CAUSE SERIOUS BODILY INJURY, SEVERE BURNS, AND/OR ELECTROCUTION.** Call local utility companies or your local "One-Call" number at least 48 hours before digging and have underground utilities marked.



WARNING: Never use hands to search for leaks. Instead, use a piece of cardboard or wood. Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious injury. Before disconnecting lines, be sure to relieve pressure. Before applying pressure, be sure connections are tight and fittings and hoses are not damaged.

If injured by escaping fluid, see a doctor at once. Serious infection and/or reaction can develop if proper medical treatment is not administered immediately.



CAUTION:

1. Read and understand this operator's manual and the operator's manual for the engine before operating.
2. Read and understand the operator's manual for the equipment to be operated with the Hydraulic Power Source.
3. Always correctly install the torque tube before operating the earth drill.
4. Make sure everyone is clear before operating.
5. Keep bystanders at least 10 feet away from work area.
6. Before starting, be sure hydraulic pressure is off.
7. Relieve hydraulic pressure before disconnecting lines.
8. Shut off engine to adjust, service, clean or re-fuel.
9. Keep all safety shields and devices in place.
10. Keep hands, feet and clothing away from moving parts.
11. Do not leave machine unattended with engine running.
12. Wear safety glasses.

NOTICE

It is the responsibility of the contractor, owner and user to maintain and operate the Hydraulic Power Source in compliance with operating instructions provided. Observe all listed safety instructions and other reasonable safety practices. LB EQUIPMENT, INC. accepts no responsibility for damages to this machine, and other property damage and/or bodily injury due to careless or improper operations.

LB EQUIPMENT, INC. does not recommend or condone any unauthorized modifications to the Hydraulic Power Source.

LB EQUIPMENT, INC. reserves the right to make changes in design and changes for improvements upon its product without imposing any obligation upon itself to install the same upon its products theretofore manufactured.

Your operators manual offers recommendations for prolonged and satisfactory service.



MAINTENANCE AND LUBRICATION

Engines are shipped without oil or gasoline. Refer to MANUFACTURER'S INSTRUCTIONS for proper procedures and recommended fluids.



SHUT OFF ENGINE to adjust, service, clean or refuel the machine.

HYDRAULIC RESERVOIR:

The hydraulic reservoir should be filled to the "FULL" mark on the dipstick with recommended hydraulic oil.

Hydraulic Oil Recommendation: Most premium grade, mineral-oil based hydraulic fluids with an anti-foam inhibitor is suitable.

ISO VG 46 fluids are recommended for normal temperature operation while ISO VG 32 fluids can be used in colder climates and ISO VG 68 can be used in warmer climates.

The hydraulic oil and return line oil filter should be changed after the first 15 hours of use and once every 500 hours or 3 months thereafter.

IMPORTANT: Never attempt to start engine with a low hydraulic oil level. A low hydraulic oil level will cause excessive heat and premature component failures.

NOTE: Both engine oil and hydraulic oil levels should be checked prior to each day's use.



WARNING: NEVER use hands to search for leaks, instead, use a piece of cardboard or wood. Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious injury. Before disconnecting lines, be sure to relieve pressure. Before applying pressure, be sure connections are tight and fittings and hoses are not damaged.

If injured by escaping fluid, see a doctor at once. Serious infection and/or reaction can develop if proper medical treatment is not administered immediately.

HYDRAULIC OIL LEAKAGE: If any hydraulic oil leakage is encountered, check and properly tighten the associated fitting. (Refer to torque chart for proper assembly torque). If the leakage persists, it may be necessary to replace the associated fitting or hose assembly.

IMPORTANT: All nuts, fasteners, and fittings must be kept tightened. Refer to Torque Chart for proper assembly torque.

WIRING INFORMATION:

The cooling fan and hour meter are connected to the Load (LO) wire from the engine wiring harness. See the engine owner's manual for specific information.



BEFORE STARTING THE ENGINE. Be sure that:

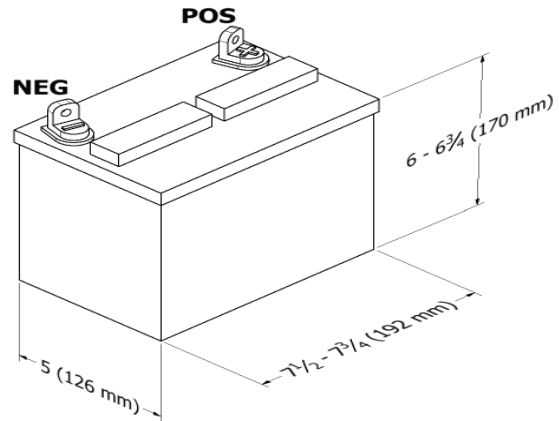
- 1) Engine is properly prepared to Manufacturer's specifications. Refer to engine manufacturer's instructions.
- 2) Fuel valve is open (if equipped).
- 3) Hydraulic fluid level is maintained properly.
- 4) Pigtail hoses are connected together **or** a tool is connected to the power unit.
- 5) Battery is properly charged.

Recommended Battery

U1 - 12 volt - 250-350 cca
Lawn & Garden tractor battery.
Example: Champion Lawn/Garden Part # GT-2
275 series. Terminals arranged as indicated

Maximum Battery Size:

8 1/2" L x 5 1/2" W x 8 1/2" H
216mm x 140mm x 216mm



OPERATING INSTRUCTIONS



DANGER: NEVER run engine inside building or enclosed area. Exhaust gases contain carbon monoxide, an odorless and deadly poison.

TO START THE ENGINE:

Pull the choke lever out to choke the engine. Set the throttle lever between one-half throttle and full throttle. Turn the key clockwise to start the engine. After the engine starts, gradually push the choke lever in fully and allow the engine to warm-up for 2 to 3 minutes.



READ AND UNDERSTAND THE OPERATOR'S MANUAL FOR THE EQUIPMENT TO BE OPERATED WITH THE HYDRAULIC POWER SOURCE.

THROTTLE/HYDRAULIC FLOW:

The nominal operating flow of the power source is:

18 HP = 8 gpm
19/20 HP = 10 gpm
24/27 HP = 12 gpm

The rpm of the engine may be reduced to reduce the flow rate if necessary.

NOTE: Running engine for a prolonged period of time at too low an RPM will result in battery discharge which will reduce fan speed, causing the hydraulic oil to become too hot.



MAKE SURE EVERYONE IS CLEAR BEFORE OPERATING.



operating instructions, continued...



KEEP ALL SAFETY SHIELDS AND DEVICES IN PLACE.



KEEP HANDS, FEET, AND CLOTHING AWAY FROM MOVING PARTS.

CHANGING THE PRESSURE RELIEF SETTING:

The PS-18/19/20/24 hydraulic power source is equipped with a pressure relief valve to protect the equipment from high pressure spikes in the oil circuit. It is factory set to 2500 PSI - 3000 PSI when used with the Big Beaver)for compatibility with most hydraulic tools, but may be adjusted to a higher or lower setting if required. (Min. 1000 PSI, Max. 3000 PSI).

The relief valve is located on the side of the manifold valve (behind the front panel). Loosen the locking nut using a 17 mm open end wrench, then use an 8 mm hex wrench, adjust the relief valve. Turning the wrench clockwise will increase the pressure setting, counter-clockwise will decrease the pressure setting.

To check the setting, connect the pigtail hoses together.

Start the engine, then disconnect the pigtail hoses.



CAUTION: Do not operate the power source in relief as described above for more than 5 seconds. Overheating and damage to the equipment may occur.



WARNING: Operating tools at a higher pressure than recommended may cause damage to the tool, resulting in serious injury or death to the operator.

CONNECTING TOOLS:

Before connecting any tool to the hydraulic power source, make sure that it is compatible with the flow and pressure range of the power source. Also make certain that the relief valve setting, which determines the maximum pressure that the unit will apply to the tool, is properly adjusted.



IMPORTANT: **CHECK** the flow direction of the tool. The pressure (in) hose from the tool should have a female quick disconnect fitting. The return (out) side should have a male quick disconnect fitting.

Connect the "RETURN" ("R") side first by aligning the male and female quick disconnects and pushing them together firmly. You will hear or feel a click and the locking collar will snap closed when they are correctly seated. Rotate the locking collar slightly to avoid inadvertent uncoupling. Connect the "PRESSURE" ("M") side in the same manner. To start the flow of oil to the tool, first check that bystanders are clear of the tool and that the operator is ready, then start the engine.



CAUTION: MAKE sure everyone is clear before operating.



CAUTION: READ and understand the operator's manual for the equipment to be operated with the hydraulic power source.



WARNING: Operating tools at a higher pressure than recommended or with the flow reversed may cause damage to the tool, resulting in injury or death to the operator.

IMPORTANT: Do not allow hydraulic oil temperature to exceed 180 degrees Fahrenheit (F). Also, only allow intermittent hydraulic oil temperatures exceeding 165 degrees Fahrenheit (F). Hydraulic component damage may occur when operating unit with hydraulic oil temperatures exceeding 180 degrees Fahrenheit (F) or temperatures exceeding 165 degrees Fahrenheit (F) for extended periods of time. **NOTE:** If oil temperature becomes too high, reduce oil pressure by reducing load on tools (place valves in neutral position). Allow oil to circulate at reduced pressure (<500 psi) until oil temperature is adequately reduced.

TO STOP THE ENGINE,

- 1.) Push the throttle lever down to idle position.
- 2.) Turn key counterclockwise to off position.

DISCONNECTING TOOLS:

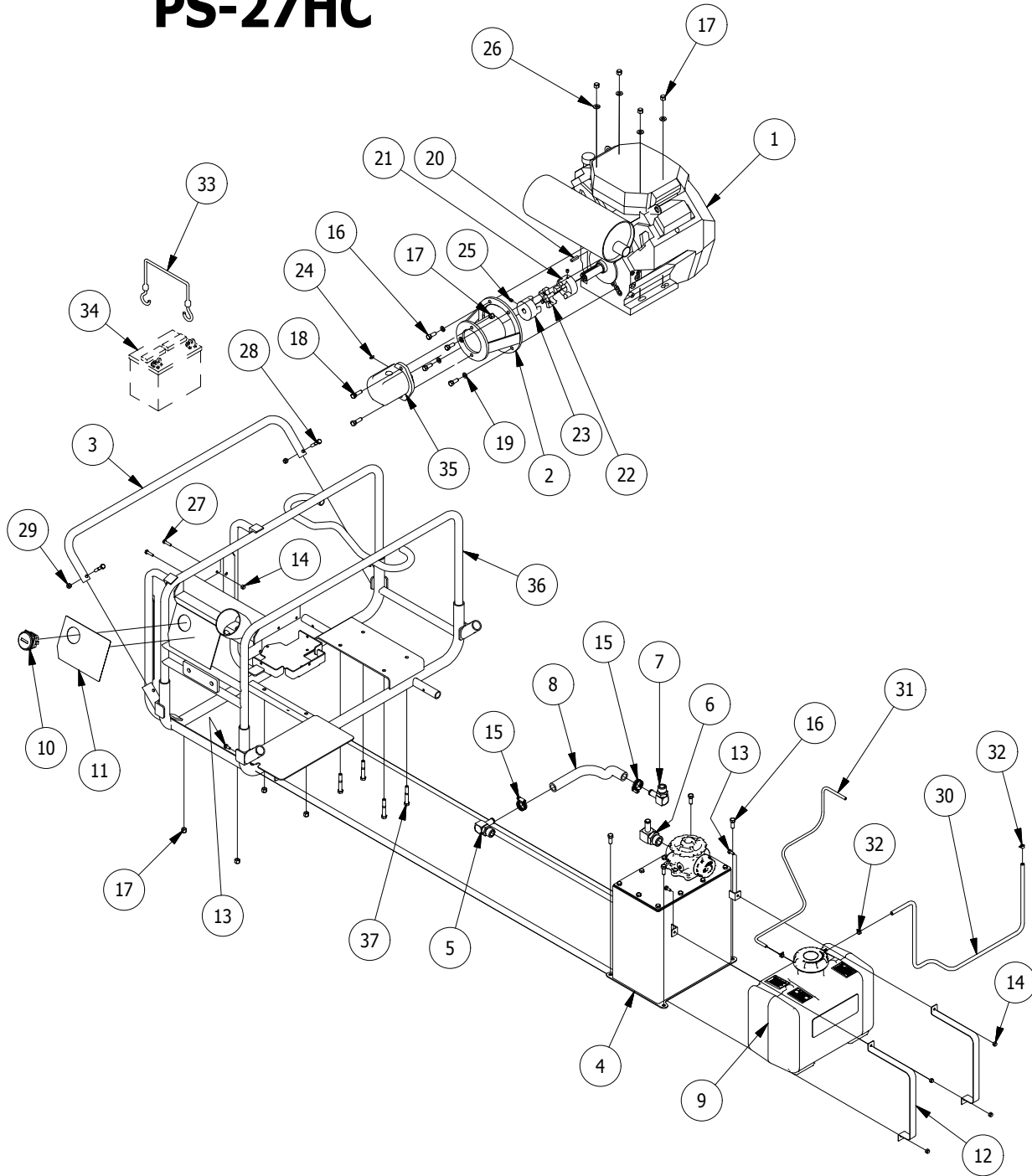
Stop the engine.

Disconnect the "PRESSURE" side first by rotating the locking collar until the notch aligns with the bead on the female fitting. Push the locking collar toward the bead and the fittings will disconnect. Disconnect the "RETURN" side in the same manner.



PS-20HC Hydraulic Power Source

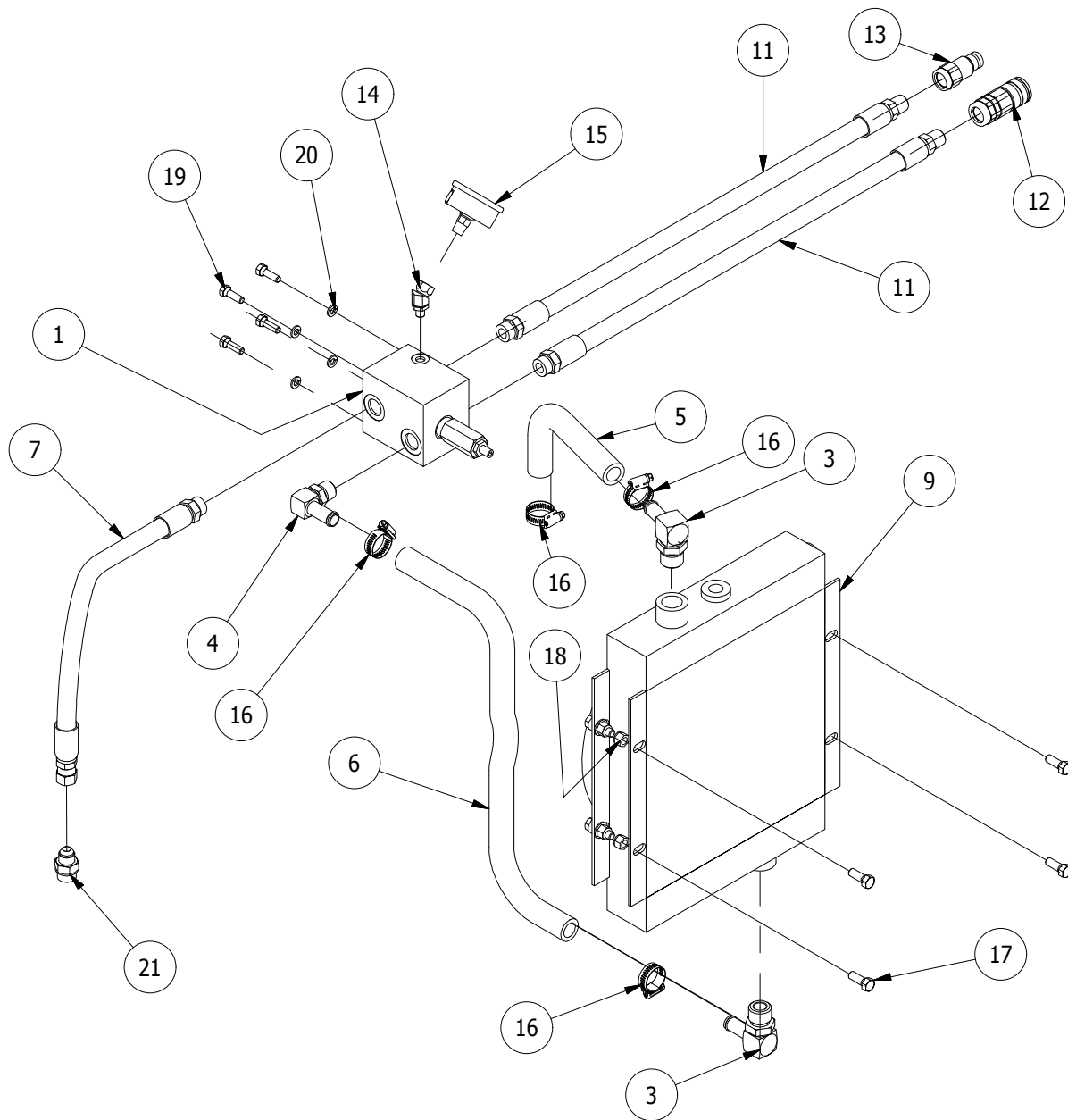
PS-27HC



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	3001-20HA	ENGINE, 20 HP HONDA, GX630
1	1	3001-27K	ENGINE, 27 HP KOHLER, ECH749
2	1	35528	BRACKET, PUMP MOUNTING
2	1	35670	BRACKET, PUMP MOUNTING, PS-27
3	2	35516	TUBE, FRAME
4	1	35610	HYDRAULIC TANK ASSEMBLY
5	1	35280	ELBOW, 90, 1-1/16 O-RING X 3/4 BH
6	1	35598	ELBOW, 90, 1-5/16 O-RING X 3/4 BH
7	3	35280	ELBOW, 90, 1-1/16 O-RING X 3/4 BH
8	1	35621	HOSE, TANK TO PUMP
9	1	35640	FUEL TANK ASSEMBLY, EPA
10	1	35215	HOUR METER
11	1	35545	PANEL, SAFETY SIGN
12	2	35645	STRAP, MOUNTING, FUEL TANK
13	4	4008-1	BOLT, HEX, 1/4 X 5/8 NC GR.5
14	8	30204	NUT, HEX, 1/4 NC, NYLON LOCK
15	6	30270-3	CLAMP, HOSE
16	16	3012-2	BOLT, HEX, 3/8 X 1, NC GR.5
16	4	71584	BOLT, HEX, 7/16 X 1-1/5, NC GR.5
17	18	30154	NUT, HEX, 3/8 NC, NYLON LOCK
18	2	9027-8	BOLT, HEX, 3/8 X 1-1/4, NC GR.5
19	4	3012-3	WASHER, LOCK, 3/8
19	4	71585	WASHER, LOCK, 7/16
20	1	4081	KEY, 1/4 X 1/4 X 1-1/8
21	1	30268	COUPLING, FLEX., 1 BORE, ENGINE
21	1	30268-W	COUPLING, FLEX., 1-1/8 BORE, ENGINE
22	1	30269	COUPLING, FLEX., SPIDER
23	1	30267-58	COUPLING, FLEX., 5/8 BORE, PUMP
24	1	30168-505	KEY, WOODRUFF, #505
25	2	30171	SCREW, SET, 5/16 X 5/16 NC
26	4	3002-B	WASHER, FLAT, 3/8 SAE
27	2	9024-BP	BOLT, HEX, 1/4 X 1, NC GR.5
28	4	3002-A	BOLT, 5/16 X 1-3/4, NC GR.5
29	4	30318	NUT, HEX, 5/16 NYLON LOCK
30	1	35646	HOSE, FUEL LINE
31	1	35647	HOSE, VAPOR LINE
32	3	4062	CLAMP, FUEL LINE
33	1	35561	BUNGEE CORD, 10"
34	1	BATTERY	BATTERY, U1L (ACQUIRE LOCALLY)
35	1	35252	PUMP, HYD. GEAR, 11cc DISPL.
35	1	35257	PUMP, HYD. GEAR, 14cc DISPL.
36	1	35625	FRAME, MAIN, HIGH CAPACITY
36	1	35675	FRAME, MAIN, HIGH CAPACITY, PS-27
37	4	35569	BOLT, HEX, 3/8 X 2-1/2, NC GR.5

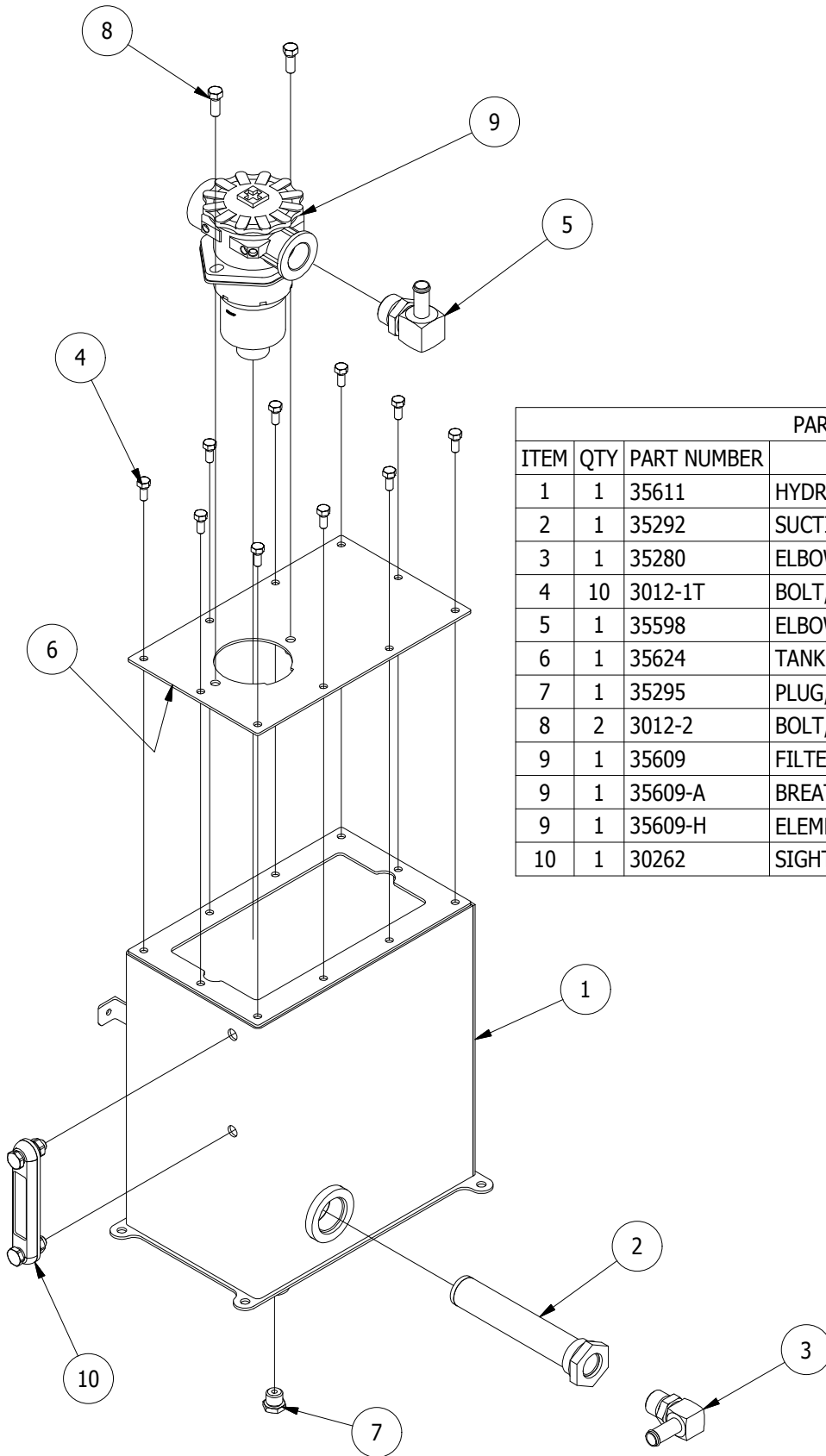
PS-20HC / PS-27HC Hydraulic Power Source

PS-20HC / PS-27HC Hydraulic Power Source Manifold / Cooler / Fan Assembly



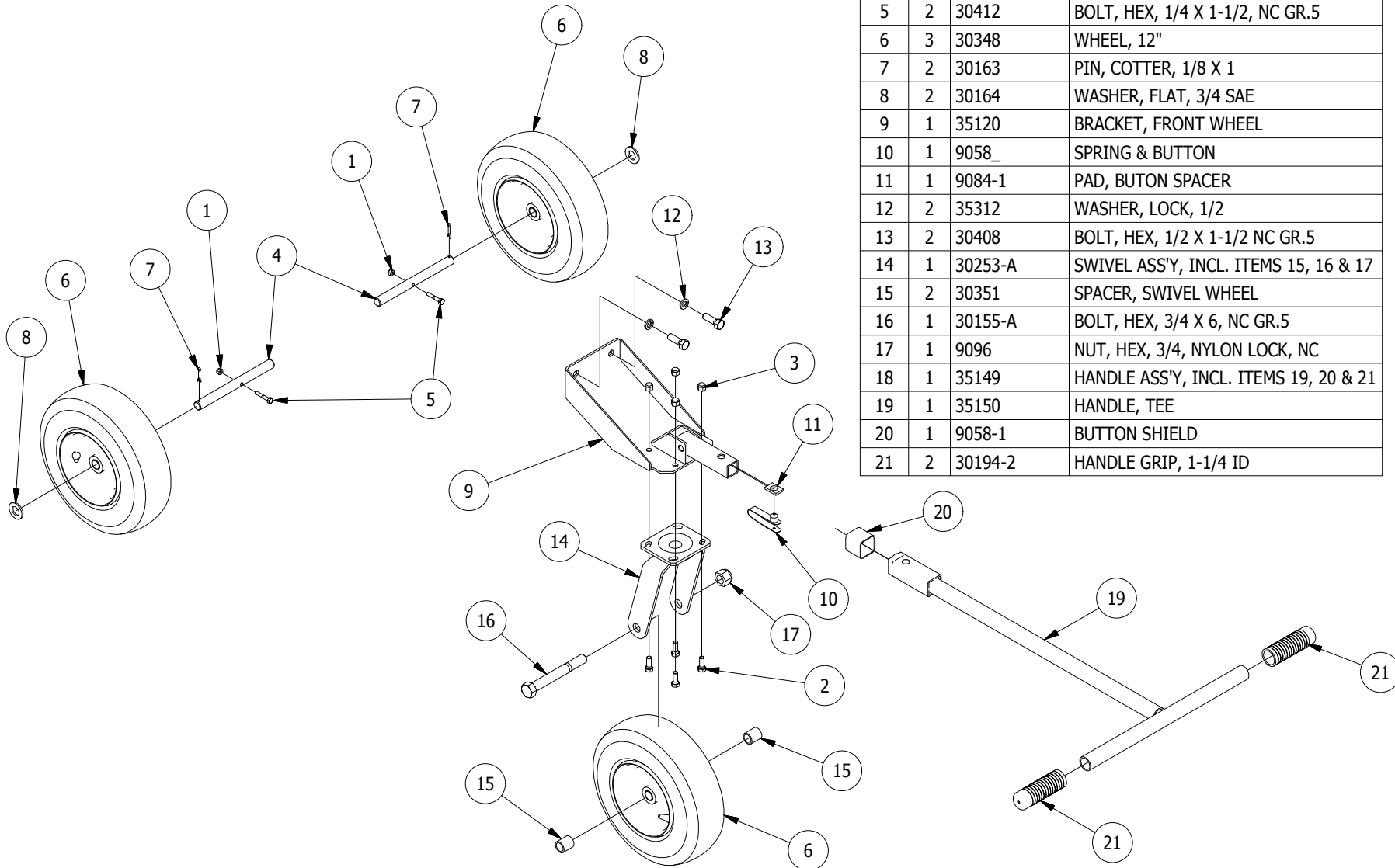
PARTS LIST				PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	35500-R	MANIFOLD VALVE, RELIEF ONLY	12	1	35260	QUICK DISCONNECT, 08 FEMALE
2	1	35502-R	RELIEF VALVE, DIRECT ACTING	13	1	35261	QUICK DISCONNECT, 08 MALE
3	3	35280	ELBOW, 90, 1-1/16 O-RING X 3/4 BH	14	1	35284	ELBOW, 45, SAE 04 X 1/4 NPT
4	1	35294	ELBOW, 90, 7/8 O-RING X 3/4 BH	15	1	35210	GAUGE, PRESSURE
5	1	35618	HOSE, COOLER TO FILTER	16	6	30270-3	CLAMP, HOSE
6	1	35620	HOSE, MANIFOLD TO COOLER	17	16	3012-2	BOLT, HEX, 3/8 X 1, NC GR.5
7	1	35622	HOSE ASS'Y, PUMP TO MANIFOLD	18	18	30154	NUT, HEX, 3/8 NC, NYLON LOCK
8	1	35630	HEAT EXCHANGER / FAN ASSEMBLY	19	4	9024-1	BOLT, HEX, 5/16 X 1, NC GR.5
9	1	35630-C	HEAT EXCHANGER ONLY	20	4	3002-C	WASHER, LOCK, 5/16
10	1	35630-F	FAN ONLY	21	1	35588	ADAPTER FITTING, 6400-8-10-0
11	2	35623	HOSE ASSEMBLY, PIG TAIL PRESSURE/RETURN				

PS-20HC /PS-27HC Hydraulic Power Source Hydraulic Tank Assembly



PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	35611	HYDRAULIC TANK WELDMENT
2	1	35292	SUCTION STRAINER, O-RING
3	1	35280	ELBOW, 90, 1-1/16 O-RING X 3/4 BH
4	10	3012-1T	BOLT, HEX, 5/16 X 3/4, NC GR.5
5	1	35598	ELBOW, 90, 1-5/16 O-RING X 3/4 BH
6	1	35624	TANK LID WELDMENT
7	1	35295	PLUG, MAGNETIC, 3/4 O-RING
8	2	3012-2	BOLT, HEX, 3/8 X 1, NC GR.5
9	1	35609	FILTER ASS'Y, IN-TANK
9	1	35609-A	BREATHER, FILTER ASS'Y, IN-TANK
9	1	35609-H	ELEMENT, FILTER ASS'Y, ASS'Y
10	1	30262	SIGHT GAUGE ASS'Y WITH THERMOMETER

PS-20HC / PS-27HC Hydraulic Power Source Three Wheel Kit



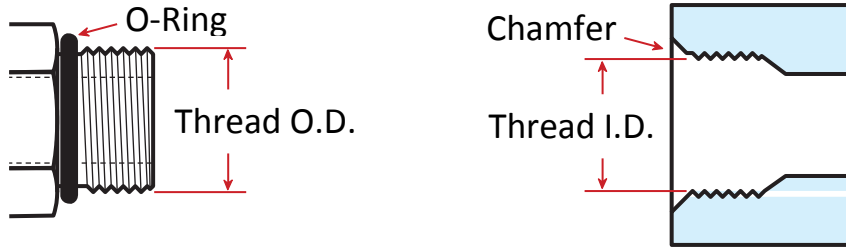
PARTS LIST			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	8	30204	NUT, HEX, 1/4 NC, NYLON LOCK
2	16	3012-2	BOLT, HEX, 3/8 X 1, NC GR.5
3	18	30154	NUT, HEX, 3/8 NC, NYLON LOCK
4	2	35544	AXLE
5	2	30412	BOLT, HEX, 1/4 X 1-1/2, NC GR.5
6	3	30348	WHEEL, 12"
7	2	30163	PIN, COTTER, 1/8 X 1
8	2	30164	WASHER, FLAT, 3/4 SAE
9	1	35120	BRACKET, FRONT WHEEL
10	1	9058_	SPRING & BUTTON
11	1	9084-1	PAD, BUTON SPACER
12	2	35312	WASHER, LOCK, 1/2
13	2	30408	BOLT, HEX, 1/2 X 1-1/2 NC GR.5
14	1	30253-A	SWIVEL ASS'Y, INCL. ITEMS 15, 16 & 17
15	2	30351	SPACER, SWIVEL WHEEL
16	1	30155-A	BOLT, HEX, 3/4 X 6, NC GR.5
17	1	9096	NUT, HEX, 3/4, NYLON LOCK, NC
18	1	35149	HANDLE ASS'Y, INCL. ITEMS 19, 20 & 21
19	1	35150	HANDLE, TEE
20	1	9058-1	BUTTON SHIELD
21	2	30194-2	HANDLE GRIP, 1-1/4 ID

**PS-20HC / PS-27HC Hydraulic Power Source
Three Wheel Kit**

Hydraulic Fitting Thread Identification and Assembly Torque

SAE Straight Thread O-Ring (ORB):

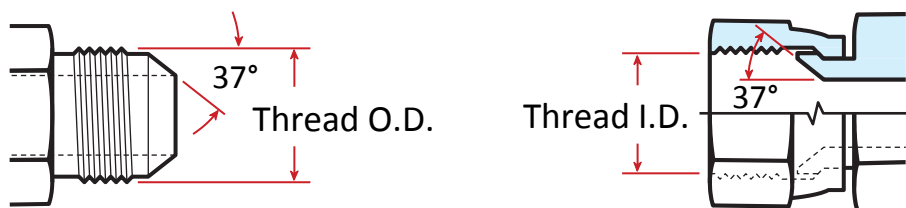
This fitting (also called O-Ring Boss) is recommended for use in medium to high pressure hydraulic systems with optimum leakage control. The male fitting has a straight thread and O-ring. The female fitting has a straight thread with a machined perpendicular surface and a chamfer to accept the O-ring. Sealing is accomplished by compressing the O-ring into the chamfer while the threads hold connection mechanically. Lubricate O-ring with light coat of system oil to prevent damage to O-ring when installing to proper torque.



Nominal Inch Size	Dash Size	Nominal Thread Size	Male Thread O.D. (Inches)	Female Thread I.D. (inches)	Torque (Ft*Lbs) Adjustable Fitting	Torque (Ft*Lbs) Non-Adj Fitting
1/8	-02	5/16 - 24	5/16 (.31)	9/32 (.27)	6	8
3/16	-03	3/8 - 24	3/8 (.38)	11/32 (.34)	11	14
1/4	-04	7/16 - 20	7/16 (.44)	13/32 (.39)	14	18
5/16	-05	1/2 - 20	1/2 (.50)	15/32 (.45)	22	23
3/8	-06	9/16 - 18	9/16 (.56)	17/32 (.51)	27	28
1/2	-08	3/4 - 16	3/4 (.75)	11/16 (.69)	42	48
5/8	-10	7/8 - 14	7/8 (.88)	13/16 (.81)	60	90
3/4	-12	1 1/16 - 12	1 1/16 (1.06)	1 (.98)	80	110
7/8	-14	1 3/16 - 12	1 3/16 (1.19)	1 1/8 (1.10)	105	145
1	-16	1 5/16 - 12	1 5/16 (1.31)	1 1/4 (1.23)	115	160
1 1/4	-20	1 5/8 - 12	1 5/8 (1.63)	1 9/16 (1.54)	225	225
1 1/2	-24	1 7/8 - 12	1 7/8 (1.88)	1 13/16 (1.79)	250	250
2	-32	2 1/2 - 12	2 1/2 (2.50)	2 7/16 (2.42)	325	325

JIC 37° Flare:

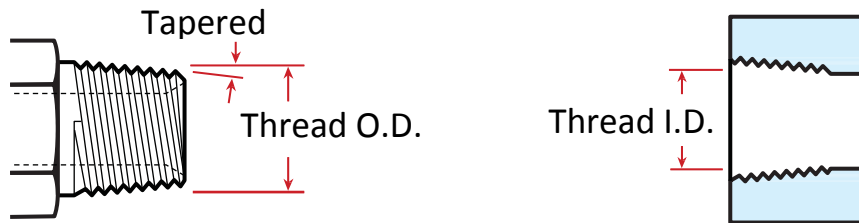
This fitting is very common in hydraulic systems and was originally named for the Joint Industrial Commission (JIC). Both the male and female fittings have 37° seats. Sealing is accomplished by establishing a line of contact between the male flare and female cone seat while the threads hold the connection mechanically. Lubricate threads with a light coat of system oil. Use either the F.F.F.T. (Flats From Finger Tight) or Torque value method for proper assembly of fittings. F.F.F.T. is a Turns Method that counts the number of hex flats past the finger tight position.



Tube Size (inches)	Dash Size	Nominal Thread Size	Male Thread O.D. (Inches)	Female Thread I.D. (inches)	Flats From Finger Tight (F.F.F.T.)	Torque (Ft*Lbs)
1/8	-02	5/16 - 24	5/16 (.31)	9/32 (.27)	N/A	6 - 7
3/16	-03	3/8 - 24	3/8 (.38)	11/32 (.34)	N/A	8 - 9
1/4	-04	7/16 - 20	7/16 (.44)	13/32 (.39)	2	11 - 12
5/16	-05	1/2 - 20	1/2 (.50)	15/32 (.45)	2	14 - 15
3/8	-06	9/16 - 18	9/16 (.56)	17/32 (.51)	1 1/2	18 - 20
1/2	-08	3/4 - 16	3/4 (.75)	11/16 (.69)	1 1/2	36 - 39
5/8	-10	7/8 - 14	7/8 (.88)	13/16 (.81)	1 1/2	57 - 63
3/4	-12	1 1/16 - 12	1 1/16 (1.06)	1 (.98)	1 1/4	79 - 88
7/8	-14	1 3/16 - 12	1 3/16 (1.19)	1 1/8 (1.10)	1	94 - 103
1	-16	1 5/16 - 12	1 5/16 (1.31)	1 1/4 (1.23)	1	108 - 113
1 1/4	-20	1 5/8 - 12	1 5/8 (1.63)	1 9/16 (1.54)	1	127 - 133
1 1/2	-24	1 7/8 - 12	1 7/8 (1.88)	1 13/16 (1.79)	1	158 - 167
2	-32	2 1/2 - 12	2 1/2 (2.50)	2 7/16 (2.42)	1	245 - 258

NPT (National Pipe Tapered):





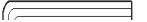
The thread is tapered and sealing is done by the deformation of threads as the fitting is tightened. Therefore, NPT fittings have a limited life expectancy when disassembled/assembled and will need to be replaced to avoid potential leakage problems. It is recommended to use a pipe thread sealant when assembling NPT fittings. Teflon tape is not recommended, but it may be used on NPT fittings only. The preferred method for tightening NPT fittings is T.P.F.T. (Turns Past Finger Tight). The torque values in chart should only be used as reference.



Inch Size	Dash Size	Nominal Thread Size	Male Thread O.D. (Inches)	Female Thread I.D. (inches)	Turns Past Finger Tight (T.P.F.T.)	Torque (Ft*Lbs)
1/8	-02	1/8 - 27	13/32 (.41)	3/8 (.38)	2 - 3	12
1/4	-04	1/4 - 18	17/32 (.54)	1/2 (.49)	2 - 3	25
3/8	-06	3/8 - 18	11/16 (.68)	5/8 (.63)	2 - 3	40
1/2	-08	1/2 - 14	27/32 (.84)	25/32 (.77)	2 - 3	54
3/4	-12	3/4 - 14	1 1/16 (1.05)	1 (.98)	2 - 3	78
1	-16	1 - 11.5	1 5/16 (1.32)	1 1/4 (1.24)	1.5 - 2.5	112
1 1/4	-20	1 1/4 - 11.5	1 21/32 (1.66)	1 19/32 (1.58)	1.5 - 2.5	154
1 1/2	-24	1 1/2 - 11.5	1 29/32 (1.90)	1 13/16 (1.82)	1.5 - 2.5	211
2	-32	2 - 11.5	2 3/8 (2.38)	2 5/16 (2.30)	1.5 - 2.5	300

IMPORTANT: All nuts, fasteners, and fittings must be kept tightened. Refer to torque chart for proper assembly torque.

TORQUE INFORMATION

 TYPE SIZE	HEX HEAD			SOCKET	
	 GRADE 5	 GRADE 8	 WRENCH SIZE inch		 WRENCH SIZE
No. 4	8 in lb	12 in lb	1/4"	12 in lb	3/32"
No. 6	16 in lb	23 in lb	5/16"	21 in lb	7/64"
No. 8	30 in lb	41 in lb	11/32"	42 in lb	9/64"
No.10	43 in lb	60 in lb	3/8"	60 in lb	5/32"
1/4"	8 ft lb	12 ft lb	7/16"	12 ft lb	3/16"
5/16"	17 ft lb	25 ft lb	1/2"	24 ft lb	1/4"
3/8"	30 ft lb	45 ft lb	9/16"	43 ft lb	5/16"
7/16"	50 ft lb	70 ft lb	5/8"	69 ft lb	3/8"
1/2"	75 ft lb	110 ft lb	3/4"	105 ft lb	3/8"
9/16"	110 ft lb	150 ft lb	13/16"	158 ft lb	-----
5/8"	150 ft lb	220 ft lb	15/16"	195 ft lb	1/2"
3/4"	260 ft lb	380 ft lb	1-1/8"	353 ft lb	5/8"

HYDRAULIC FITTINGS

SIZE	TORQUE	SIZE	TORQUE
1/4 NPT	25 ft.lb.	7/16-20 SAE O-Ring	12 ft.lb.
3/8 NPT	50 ft.lb.	9/16-18 SAE O-Ring	20 ft.lb.
1/2 NPT	75 ft.lb.	3/4-16 SAE O-Ring	35 ft.lb.
3/4 NPT	110 ft.lb.	7/8-14 SAE O-Ring	50 ft.lb.
		1-1/16-12 SAE O-Ring	70 ft.lb.



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