



**OPERATING AND SERVICE MANUAL
MODEL: PATCHER I DIESEL**

PART MANUAL - 56933

Rev. A

Fill in appropriate fields that apply to this machine.

Machine S/N: _____

1st Hose S/N: _____

2nd Hose S/N: _____

1st Pump S/N: _____

2nd Pump S/N: _____

Engine S/N: _____

Compressor S/N: _____

Gear Box S/N (Patcher): _____

Blower S/N (Magnum): _____

Revised: 04/14

**Patcher I Diesel
Part Number 56900 (Skid Mount)**



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Patcher I Diesel

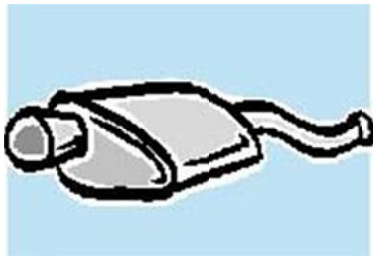
This manual is furnished with each new **CRAFCO Patcher I Diesel**. The manual will help your machine operators learn to run the mixer properly and understand its mechanical functions for trouble-free operation.

Your **CRAFCO Patcher I Diesel** is designed to give excellent service and save maintenance expense. However, as with all specifically engineered equipment, you can get best results at minimum costs if:

1. You operate your machine as instructed in this manual, and
2. Maintain your machine regularly as stated in this manual.



WARNING: The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Operate in well-ventilated area only. Engine exhaust is deadly.



SAFETY PRECAUTIONS

- High operating temperatures of product and machine require protective clothing, long sleeve shirt, long pants/coveralls, hat or hard hat (if required) and flame resistant gloves be worn by operator.

- Always wear eye protection (goggles or face shield) when operating hot compressed air lance, air gas lance and when applying material. Face shield is to be worn when adding material to the Patcher I.



- Observe all **CAUTION AND WARNING** signs posted on machine.



- Avoid the entrance of water into any part of the machine. Water will displace heat transfer oil or melted material when it reaches operating temperatures which could be hazardous to personnel surrounding the machine.

- Avoid bodily contact with hot applied patching material or heat transfer oil; serious burns may result.

- Read Operator Manual thoroughly before operating machine.

- Make sure operator is familiar with machine operation.

- Do not operate in closed building or confined areas.

- Shut-down burner and engine prior to refilling diesel tank.

- When adding material to material tank, stop mixer, lift lid, add material and close lid before restarting mixer. Hot material could splash and cause serious burns if this procedure is not followed.

- Keep hands, feet, and clothing away from all moving parts.

- Always keep a fire extinguisher near the unit. Maintain extinguisher properly and be familiar with its use.

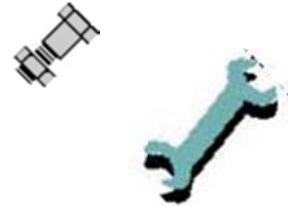
- Do not exceed 525°F. for heat transfer oil temperature.

- Do not overfill heat transfer oil level. Expansion of oil during heat up could cause overflow. Check oil each day before starting burner, add oil to touch bottom of dipstick if required (at 70°F.) Use only recommended heat transfer oil and change after 500 hours of operation or one year, whichever occurs first.

SAFETY PRECAUTIONS continued

- Follow operating instructions for starting and shut-down of burner. Instructions are mounted on control box.
- Replace any hoses which show signs of wear, fraying, or splitting. Be sure all fittings and joints are tight and leak-proof.

- Precaution is the best insurance against accidents.
- The Patcher I should not be left unattended with burner lit.
- Tighten all bolts and screws after every 100 hours of operation.



- CrafcO, Inc. assumes no liability for an accident or injury incurred through improper use of the machine.

Patcher I Diesel LIMITED WARRANTY

Crafco, Inc. through its authorized dealer, will replace for the original purchaser free of charge any parts found upon examination the factory at Chandler, Arizona, to be defective in material or workmanship. The warranty is for a period within 60 days of purchase date, but excludes engine or components, tires, and battery as these items are subject to warranties issued by their manufacturers.

After 60 days Crafco, Inc. warrants structural parts, excluding hydraulic components, material pump and hoses, applicator valves and electric components for a period of (1) one year from date of delivery. Crafco, Inc. shall not be liable for parts that have been damaged by accident, alteration, abuse, improper lubrication/maintenance, normal wear, or other cause beyond our control.

The warranty provides herein extends only to the repair and/ or replacement of those components on equipment covered above and does not cover labor costs. The warranty does not extend to incidental or consequential incurred as a result of any defect covered by this warranty.

All transportation and labor cost incurred by the purchaser in submitting or repairing covered components must be borne by the purchaser.

Crafco, Inc. specifically disavows any other representation, warranty, or liability related to the condition or use of the product.



WARNING: Use of replacement parts other than genuine Crafco parts may impair the safety or reliability of your equipment and nullifies any warranty.

CONTACT US

For Warranty:
Crafco, Inc.
25527 South Arizona Avenue, Chandler, AZ 85248
Phone: (480) 655-8333 or (800) 528-8242
Fax: (480) 655-1712

For all other inquiries:
Crafco, Inc.
420 North Roosevelt Avenue, Chandler, AZ 85226
Phone: (602) 276-0406 or (800) 528-8242
Fax: (480) 961-0513
CustomerService@crafco.com

WARRANTY CLAIM INSTRUCTIONS

Crafco, Inc., warrants parts and machinery purchased through Crafco or one of its affiliated distributors for one year from purchased or in-service date **. If parts fail to function within the first year of purchase, a return authorization number (RA) must be obtained. If the part was purchased through Crafco, Inc., please contact the Crafco returns department at [Returns@Crafco.com](mailto>Returns@Crafco.com) for a RA number or if purchased through a Crafco distributor please contact your distributor. Note: if the part has a serial number associated with it, for example; a machine or electric hose or wand, this must be furnished when requesting the RA number. The customer will be emailed or faxed a RA form with all instructions to return the item to Crafco, Inc. See example. If the part is found to be within the one year warranty period and has not been abused or modified, a credit will be issued to the customer's account or credit card. The customer may request the part be replaced instead of a credit, if desired.

** Wear items are not covered under Crafco, Inc. limited warranty. A wear item is defined as but not limited to: material pumps, sealing tips, tires, etc.

Note: All engine warranties are covered through the engine manufacturer. If you need information for a distributor in your area please contact us and we will direct you to the closest engine distributor.

**** All parts returned are tested and evaluated. If the part has been modified in anyway without prior consent from Crafco, Inc. representative, warranty is void.

Please follow the instructions stated below when calling in a Warranty Claim. Failure to follow these procedures may be cause to void the warranty.

1. Call your local Crafco Distributor. If you do not know who your local distributor is, call a Crafco Customer Service Representative, (Toll Free 1-800-528-8242) for name, location, and telephone number.
2. On contacting the distributor, be prepared to identify the serial number, model number, engine model, engine manufacturer, and the date of purchase if available.
3. Should the cause of the malfunction be a defective part, the Distributor will advise you of the procedure to follow for a replacement.
4. The warranty is valid only for parts, which have been supplied or recommended by Crafco, Inc.

If you have any additional questions regarding warranty repairs and parts, please do not hesitate to call toll free 1-800-528-8242.

SPECIFICATIONS

Vat Capacity.....	95 gallons
Heat Transfer Oil Required.....	17 gallons at 70°F.
Tank Construction.....	Double boiler type
Tank Opening Size (2).....	14.25" x 17.88" (each)
Maximum Heat Input.....	260,000 B.T.U.
Burner & Temperature Control.....	Automatic - Digital readout. Hot oil and material. Auto flame shutdown.
Engine – Kohler Model KD420 - Diesel Fueled.....	Single Cylinder (Max. Output) 9.1HP
Drive Mechanism.....	All hydraulic with two speed forward and reverse action.
Mixer.....	Horizontal shaft with 4 sweep paddles
Dry Shipping Weight (Skid).....	Approximately 3,000 lbs.
Maximum Equipped Weight (Skid).....	Approximately 4,850 lbs.
Dry Weight Trailer (If Equipped).....	900 lbs.

Patcher I Diesel

OPERATING INSTRUCTIONS

INTRODUCTION

The Crafcro Patcher I Diesel was developed to melt patching material.

DO NOT operate machine without following these instructions:

1. Check engine crankcase oil level (refer to Engine Operator Manual).
2. Check hydraulic fluid level, at ambient temperature. Add fluid if necessary to bring to correct level (approximately 3" below top of filler tube).
3. Check heat transfer oil level (see Fig. 4). At 70°F., the oil should touch the dipstick. **DO NOT** overfill or spillage may occur when oil is heated and expands. **NEVER REMOVE DIPSTICK WHEN OIL IS HOT.**
4. The rear discharge material valve should be in the closed position and the Burner Power Switch "OFF."
5. Fill engine fuel tank with diesel fuel - **DO NOT FILL ENGINE FUEL TANK WHEN BURNER IS LIT! (see Fig. 7).**
6. Lubricate mixer bearings weekly (see Fig. 1).
7. Make sure discharge gate is in the closed position (see Fig. 2).
8. Place the mixer control switch in the neutral position (see Fig. 3).

MACHINE START UP

1. Start engine. To start engine, insert key into the control panel. Turn key to first position. Warning lights should turn "ON." Turn key to second position. Engine should start. Release key when engine is running. Leave at idle for a few minutes. Move throttle lever to set engine at desired speed (see Fig. 5). Make sure hydraulic control valve switch is in the neutral position.
2. Set temperature dials to desired temperature. Hot oil temperature should not exceed 525°F. and material 410°F. (see Fig. 6).
3. Turn Burner Power Switch "ON" (see Fig. 6).

CAUTION



If the burner does not ignite the first time, turn Burner Power Switch "OFF." Then turn Burner Power Switch back "ON." Burner should ignite. If burner still does not ignite, determine cause of malfunction (see Trouble Shooting Guide, page 25).

4. Allow the heating oil to continue to heat. Place bags of material in the mixer and heat. Start the mixer as soon as possible to break up the bags. When loading solid material into the mixer tank, the mixer will stop when lifting the lid (if equipped with lid switches), add material and close the lid again to start the mixer. Following this procedure will prevent the hot material from splashing and causing serious burns to personnel.

Engage the mixer by moving the Mixer Control Switch to forward or reverse rotation. When changing the speed of mixing, move both bypass hydraulic valves simultaneously. If mixer jams, switch may be moved for opposite rotation. The speed of mixing is controlled by the position of the 2 bypass hydraulic valves (see Fig. 8). The valves should be moved together (either in or out) not one at a time. The minimum amount of material needed for proper mixer operation is 400 lbs.

5. Temperature readout on burner control box indicates material temperature. When patching material reaches correct application temperature, material may be drawn off as desired. To help speed up pour time, you can open the Gate Side Door and heat with a hand torch to help heat the discharge pipe. Discharge Gate is opened by moving handle down. Drain material into pour bucket.

Remove excess patching material from chute with scraping tool.

CAUTION: Be sure discharge gate is completely closed after each draw off. Lock handle with safety chain if machine is transported (see Fig. 2).



Gate Side Door

Grease Fitting

Fig. 1



Discharge Gate

Safety Chain

Fig. 2



Mixer Control Switch

Fig. 3



Heat Transfer Oil
Dipstick

Fig. 4

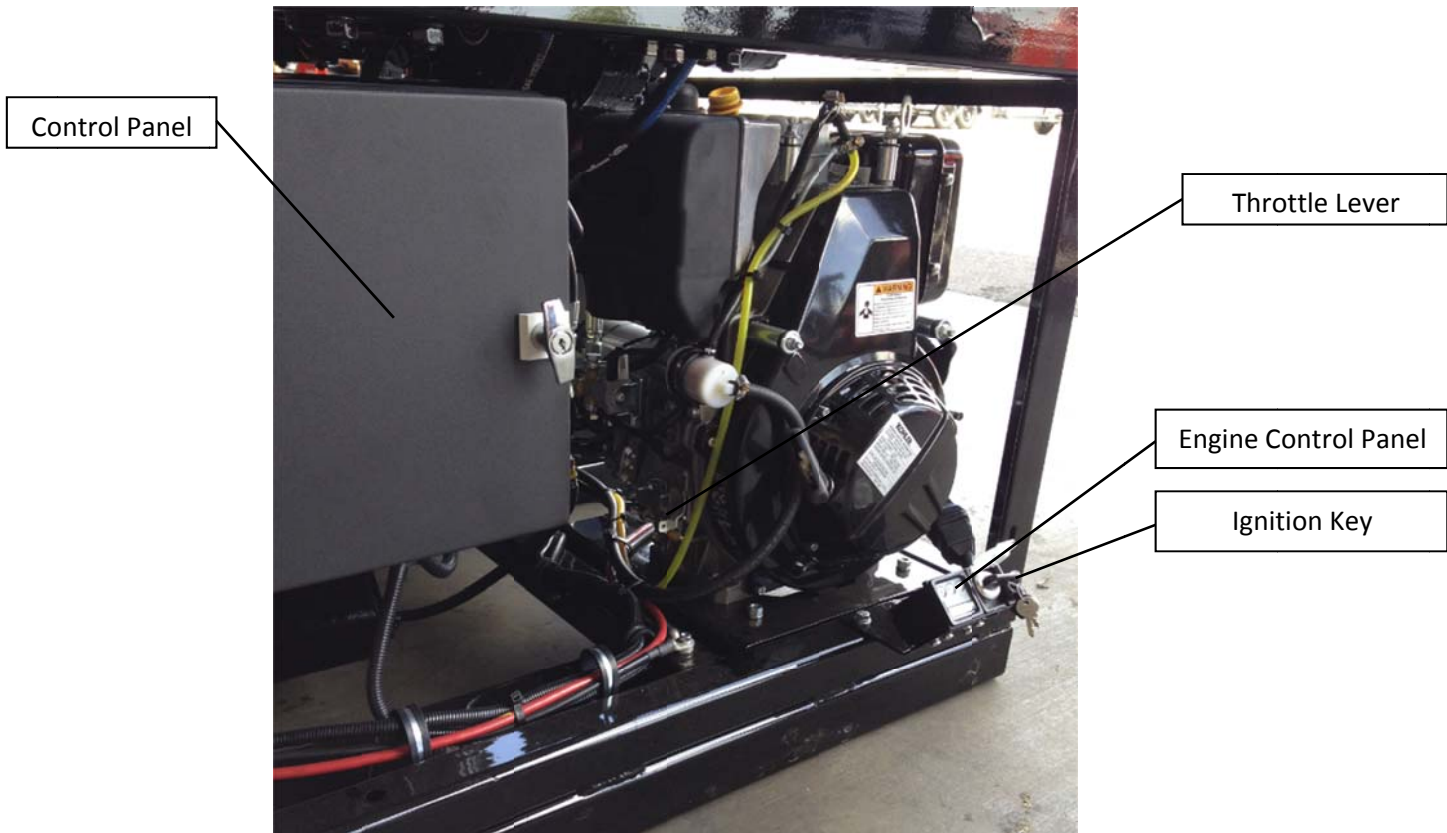


Fig. 5



Fig. 6

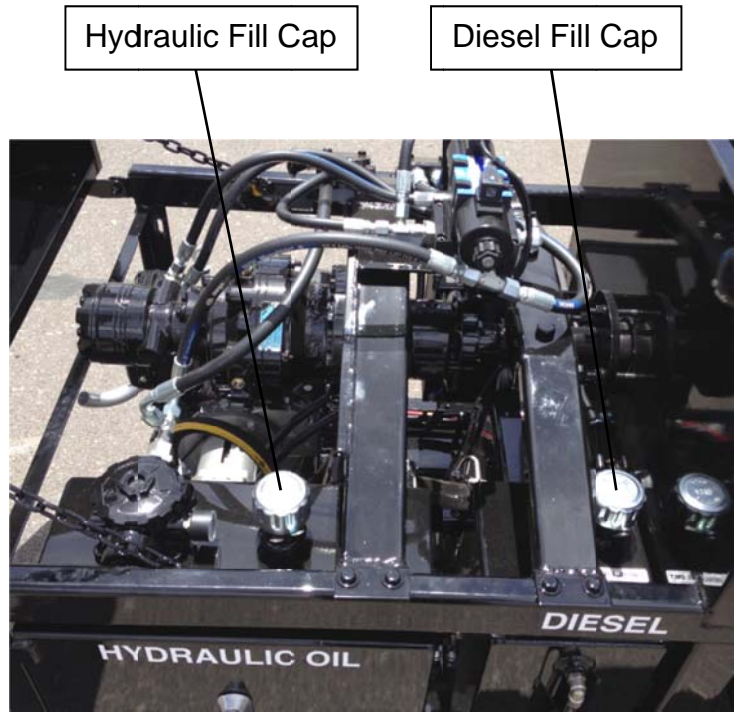
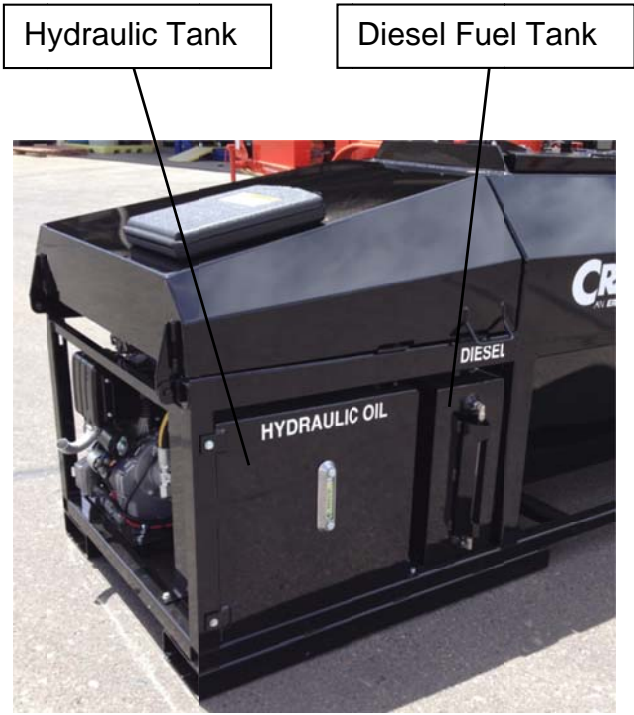


Fig. 7

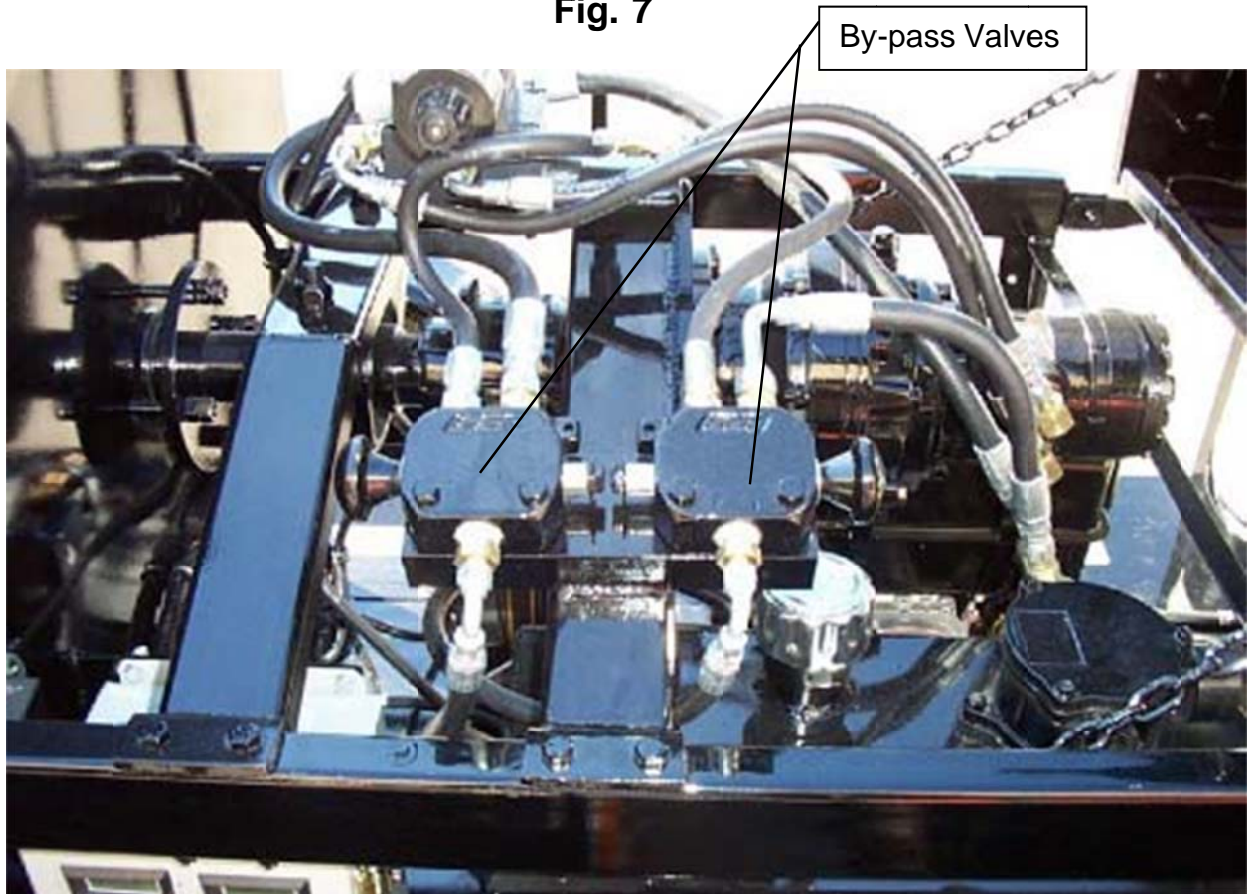


Fig. 8

CAUTION

Extreme care must be used when operating this equipment. Safety is the result of being careful and paying attention to details. Certain exposed parts of this machine, when operating, reach 500°F.; the material as high as 400°F. and the hydraulic fluid may reach 200°F. **Always** wear protective clothing and eye protection. Be sure that all joints and fittings are tight and leak-proof. Immediately replace any hose which show signs of wear, fraying or splitting. Tighten all bolts, nuts and screws every 100 hours.

SHUTDOWN PROCEDURE

1. We highly recommend emptying all, if not most of the material before shutting down the machine. It will result in faster start up times in the morning, help keep the aggregate from settling at the bottom, and offer better material performance by using fresh material.
2. Turn burner toggle switch to "OFF."
3. Return mixer hydraulic control switch to "OFF" position.
4. Turn off engine by turning off the key.

STORING MACHINE

The Patcher I should be stored in an area where moisture cannot enter machine. Extended down time can cause moisture build up in the heating oil tank.



If there is any suspicion that moisture that may have collected in the heat transfer oil, warm the heat transfer oil to 300°F. for 2 to 3 hours to evaporate the moisture.

TROUBLE SHOOTING CHART

PROBLEM	CAUSE	REMEDY
Mixer will not rotate	Sealant temperature too low.	Continue to heat material
	Too many blocks placed at one time.	Continue to heat material & try reversing mixer.
	Inadequate hydraulic flow/pressure	Check hydraulic fluid level. Reset pressure/check flow if necessary.
Slow heat up of sealant	Buildup of coked or crystallized material on the inside of material tank.	Allow machine to cool. Remove deposits and flush with solvent.
	Burner not operating	See Burner Trouble Shooting Guide.
	Low heating oil level	Make sure fluid level is correct
	Low heating oil temperature	Set at recommended temperature
	Heating oil old or has crystallized	Replace it as recommended every 500 hours
Mixer will not rotate	Mixer toggle switch turned off	Turn on toggle switch
	Bad wire connection	Find and repair
	Bad control valve	Replace valve
	Hydraulic cartridge failure	Remove and replace
	Hydraulic coil failure	Remove and replace

SERVICE INSTRUCTIONS

1. Conduct a general inspection of your machine at least once a week. Replace all worn or damaged parts, make any necessary adjustments and tighten all loose nuts or screws.



2. Keep regular replacement items in stock for emergency repairs, to avoid costly “down” time. Refer to general maintenance items.
3. Watch for leaks - tighten packing on mixer if necessary (only while machine is hot).
4. Clean machine externally periodically. Check with material manufacturer for recommendation.
5. Follow “Recommended Maintenance Procedures” per Maintenance Chart, page 20.

MAINTENANCE INSTRUCTIONS

ENGINE:

Check oil daily. Service engine per the Kohler owner's manual. See engine owner's manual for additional operating and maintenance instructions.

HYDRAULIC SYSTEM:

Check hydraulic fluid daily. Change hydraulic filter after 250 hours. Change hydraulic fluid every 500 hours of operation.

MIXER PACKING GLAND/SEALS:

Tighten gland while hot at 40 hour intervals. Do not over tighten.

MIXER SHAFT BEARINGS:

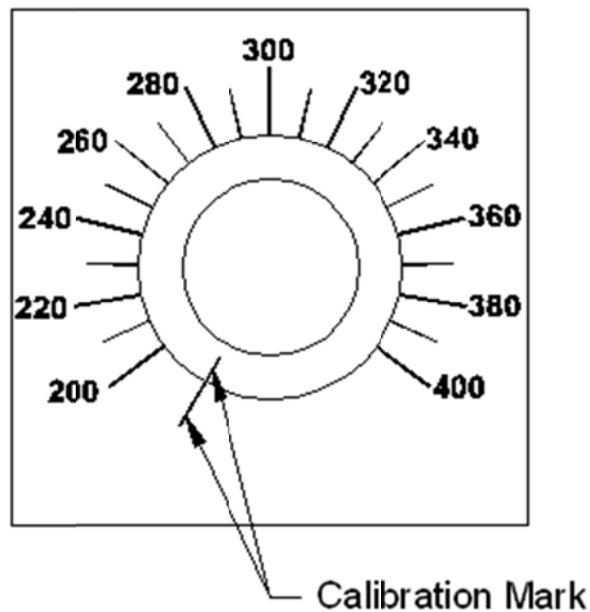
Lubricate weekly using a good grade of high temperature grease.

HEAT TRANSFER OIL:

Check level daily. Oil should touch dipstick when 70°F. Do not overfill (see Fig. 4).

TEMPERATURE CONTROL CALIBRATION:

Check control knob calibration weekly. Calibrate by aligning the line on the control knob with the calibration line on the scale plate (see below).



MAINTENANCE CHART

		HOURS			
LOCATION	PROCEDURE	8	40	250	500
Engine Oil Level	See Engine Instruction Manual.	•			
Other Engine Maintenance	See Engine Operating & Maintenance Instructions.				
Battery	Check Water Level Weekly.				
Mixer shaft Packing	Tighten when hot at 40 hour intervals. Do not over tighten.		•		
Heat Transfer Oil	Check (every 8 hours)	•			
	Change	After 500 hours or 1 year			
Hydraulic Oil Return Line Filter	Change at 250 hour			•	
Hydraulic Oil	Check Oil (every 8 hours)	•			
	Change Oil (every 500 hours)				•
	For proper oil, see Recommended Fluids & Lubricants, page 21.				
Mixer Shaft Bearings	Grease using good grade of high temp bearing grease.		•		

RECOMMENDED FLUIDS & LUBRICANTS

APPLICATION	RECOMMENDED	FULL POINT
Engine oil	Refer to Kohler owner's manual.	1.6 Qts.
Diesel	#1 Cold climate #2 Warm climate	7.4 Gals.
Hydraulic oil	Shell AW Hydraulic 46	12 Gals.
Heat transfer oil	Shell Turbo T 68 (Group II)	17 Gals.

HEAT TRANSFER OIL

The following is a list of suitable heat transfer oils to be used in CrafcO equipment.

MANUFACTURER	PRODUCT NAME
Chevron	Heat Transfer Oil Grade 46
Citgo	Hytherm Oil 46
Conoco	Hydroclear Heat Transfer Oil
Fina	Vulcan Heat Transfer Oil 46
Lubrication Engineers	Heat Transfer Oil
Exxon Mobil	Caloria HT 43
Mobil	Mobiltherm 43
Mobil	Mobiltherm 603
Phillips 66	Heat Transfer Oil #3
Phillips 66	Magnus Oil 68

TYPICAL SPECIFICATIONS

ISO	68	Viscosity Index	95-100
Flash Point, COC	445°F	Pour Point	0°F.
Viscosity @ 100°F.-SUS	325	Carbon Residue	1%
Viscosity @ 210°F.-SUS	50		



WARNING

The Heat Transfer Oil in this machine is a grade that has been tested and recommended by CRAFCO, Inc. The addition of any grade of oil not specifically recommended by CRAFCO, Inc. shall be cause for the voidance of all warranties.

All oils subjected to high temperatures deteriorate with time and lose many of their characteristics. Tests conducted by CRAFCO, Inc. have determined that for best results and safety, the Heat Transfer Oil in this machine must be drained and replaced with recommended oil after five hundred (500) hours of operation or one (1) year, whichever occurs first.

GENERAL MAINTENANCE ITEMS

RECOMMENDED QUANTITY	DESCRIPTION	PART NO.
1	Packing, mixer shaft	32226
1	Diesel Burner Assembly	46380
1	Fuel Filter (under fuel tank)	56932
1	Hydraulic Return Line Filter	45438
1	Engine Air Filter	56945
1	Engine Oil Filter	56946
1	Engine Mounted Fuel Filter	56947

INSTRUCTIONS FOR ORDERING PARTS

Parts may be ordered from your local CRAFCO distributor or directly from CRAFCO, Inc. if a distributor is not available in your area. When ordering parts, give the following information:

1. Part Number
2. Machine Model
3. Serial Number from Name Plate

Write Email or Call:

Crafco, Inc.
420 North Roosevelt Avenue, Chandler, AZ 85226
Phone: (602) 276-0406 or (800) 528-8242
Fax: (480) 961-0513
CustomerService@crafco.com

HOT APPLIED PATCHING MATERIAL PLACEMENT

Prior to the material application you will need to move the equipment to the work area. The items needed are:

1. Compressor
2. Saw to cut out repair area
3. Pneumatic hammer
4. Broom and shovels to clean up area
5. Broom or sweeper (if required to remove FOD)
6. Patcher I machine, material, and application tools
7. Dressing stone
8. Heat lance
9. Primer
10. "Hudson" sprayer for the primer
11. Paint brushes
12. Small paint cans
13. Rags
14. 1 or 2 gallons of water (to speed up cooling process if required)
15. Gloves, heavy welder gloves and standard leather gloves
16. Cloth duct tape
17. Reference materials

APPLICATION STEPS

1. Locate area to be repaired.
2. Mark the areas to be cut out. Make sure you cut out enough of the pavement to remove all cracking around the patch area. If the repair area extends to both sides of a joint, the repair area must be a minimum of 4" on each side of the joint.
3. Cut with either a wet or dry saw. The saw should cut a minimum of 1-1/2" to 2" deep.
4. Remove the remaining material with a chipping or jack hammer to a minimum depth of 1-1/2 to 2".
5. After the repair area has all the loose material removed, use the hot air lance to clean and dry the pavement.
6. Apply tape 1/4" from the edge of the prepared area.
7. Prime the area with the Primer using the "Hudson" sprayer or paint brushes. If spraying the primer on repair areas, you may need to do some touch-up with a paint brush. When touching up, you want to cover any missed spots and spread any pooled primer. Allow the primer to set up which takes about 10-12 minutes. DO NOT DRY WITH A TORCH.

APPLICATION OF THE PATCHING PRODUCT

During the time you have been preparing the patch areas you should have calculated the amount of material needed for the repairs.

Place bags of material in the mixer and heat. Start the agitator as soon as possible to break up the bags. The heat up time is usually within 60-90 minutes. Care should be taken not to overheat the material. If material temperature is too high, lower the burner material temperature control and/or open the lid.

1. Have the tools needed for the repair heating in the heated box.
2. Heat the discharge gate.
3. Remove at least two pails of product and pour back into the melter. This will insure a good flow of material when you start the application.
4. Apply the first lift of material to the repair. Apply adequate material so you get material within 1" of surface.
5. Allow the material to cool for a period of time allowing air bubbles to move to the surface of the product. The bubbles are generated from uncured primer, air, or moisture. When the bubbles stop rising to the surface (usually within 15-20 minutes). Flash surface with hand torch to "pop" bubbles.
6. Apply the next level and float surface of the material with the hot irons. Seal the edges of the repair by pulling liquid to the edge, and then remove the duct tape. The main portion of the material will self-level, but you may need to do some smoothing with the hot iron to insure a level surface.
7. Allow this material to cool similar to the first lift - you may not experience as many bubbles this time but some may appear. When they do, flash them with the torch.
8. Dry the aggregate dressing prior to placing the material as wet or damp dressing will not adhere. Smooth the aggregate dressing material over the patched area with your gloved hand. This will insure coverage of the whole surface of the material.

If you applied the aggregate dressing material too soon the bubbles will continue to rise to the surface and pop leaving a pock marked surface. If this occurs, adjust your timing to allow more bubbles to break the surface.

9. Shut down the Patcher I and clean up the repaired area. If the cooling time of the material needs to be shortened, broadcast some water over the surface.
10. Sweep excess aggregate dressing material from the surface of the repair and finish clean up.

BURNER TROUBLE SHOOTING

BURNER WILL NOT IGNITE

Step 1: Check for 12 volts at "POWER" toggle switch.

No: Engine key "OFF"

Toggle switch

"OFF" Blown fuse

Broken wire

YES: 12 volts at terminal #4 on "MATERIAL" Pak-Stat

NO: Bad Pak-Stat

Faulty sensor

YES: Check for 12 volts at terminal #7 on "OIL" Pak-Stat

NO: Bad Pak-Stat

Faulty sensor

YES: Check for 12 volts at solenoid (frame).

NO: Bad solenoid

Bad connection at battery

Faulty circuit breaker

Broken or loose wire

YES: Faulty DC Controller, poor ground / loose wire

Faulty or dirty flame

Faulty igniter transformer, cracked electrode (ceramic)

Incorrect igniter gap

Faulty fuel solenoid

Bleed fuel pump / check fuel pump coupling

Fuse under DC Controller

Blower motor relay

Faulty blower motor

Faulty 12 volt battery



BURNER LIGHTS BUT SHUTS DOWN AFTER 15 SEC.

Faulty flame eye

Broken, loose flame eye sensor wires, receptacle

Faulty DC Controller

BURNER LIGHTS BUT WILL NOT RELIGHT

Bad connection at battery

Broken or loose wires

Faulty DC Controller

Faulty 12 volt battery

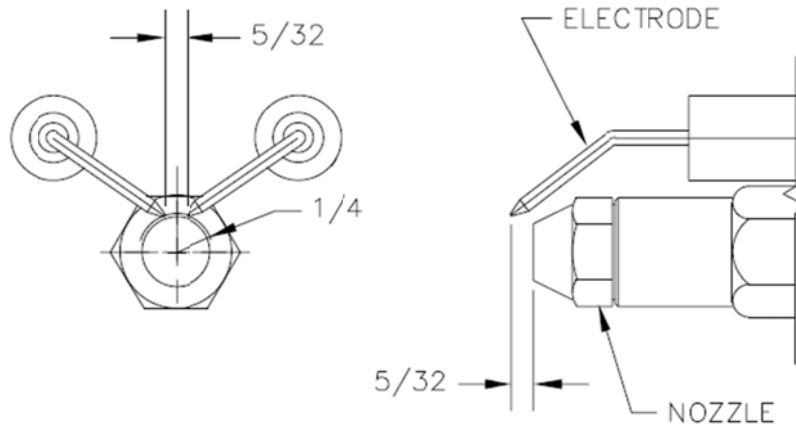
EXCESSIVE SMOKE FROM BURNER EXHAUST

Air shutter incorrectly set - set at 7

Blower motor not turning at correct speed

Faulty 12 volt battery

DIESEL BURNER ELECTRODE ADJUSTMENTS



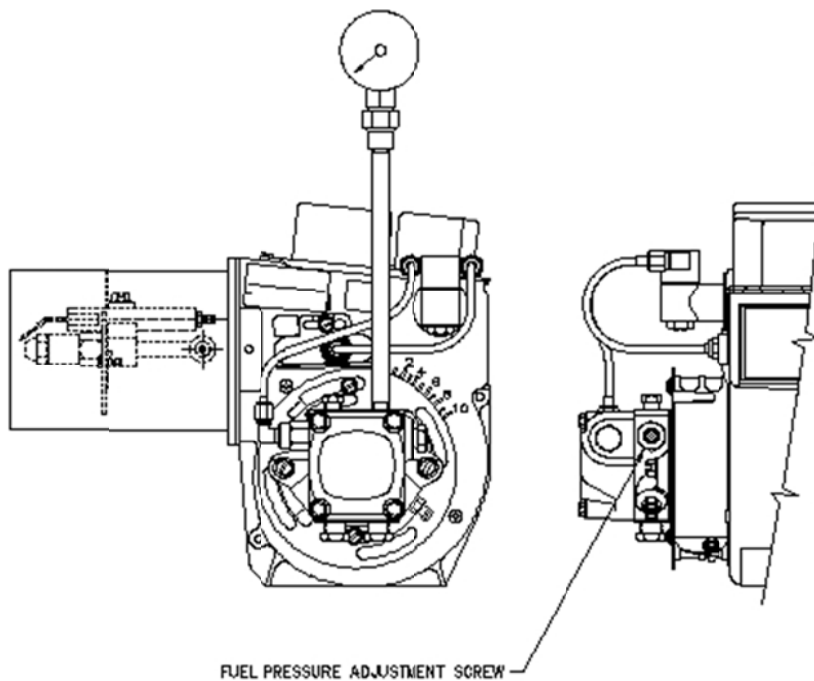
DIESEL BURNER SETTINGS

Air Shutter = 7

Air Band = 0

Fuel Pressure = 140 PSI

Use fuel and hydraulic pressure gauge kit part number 29627.



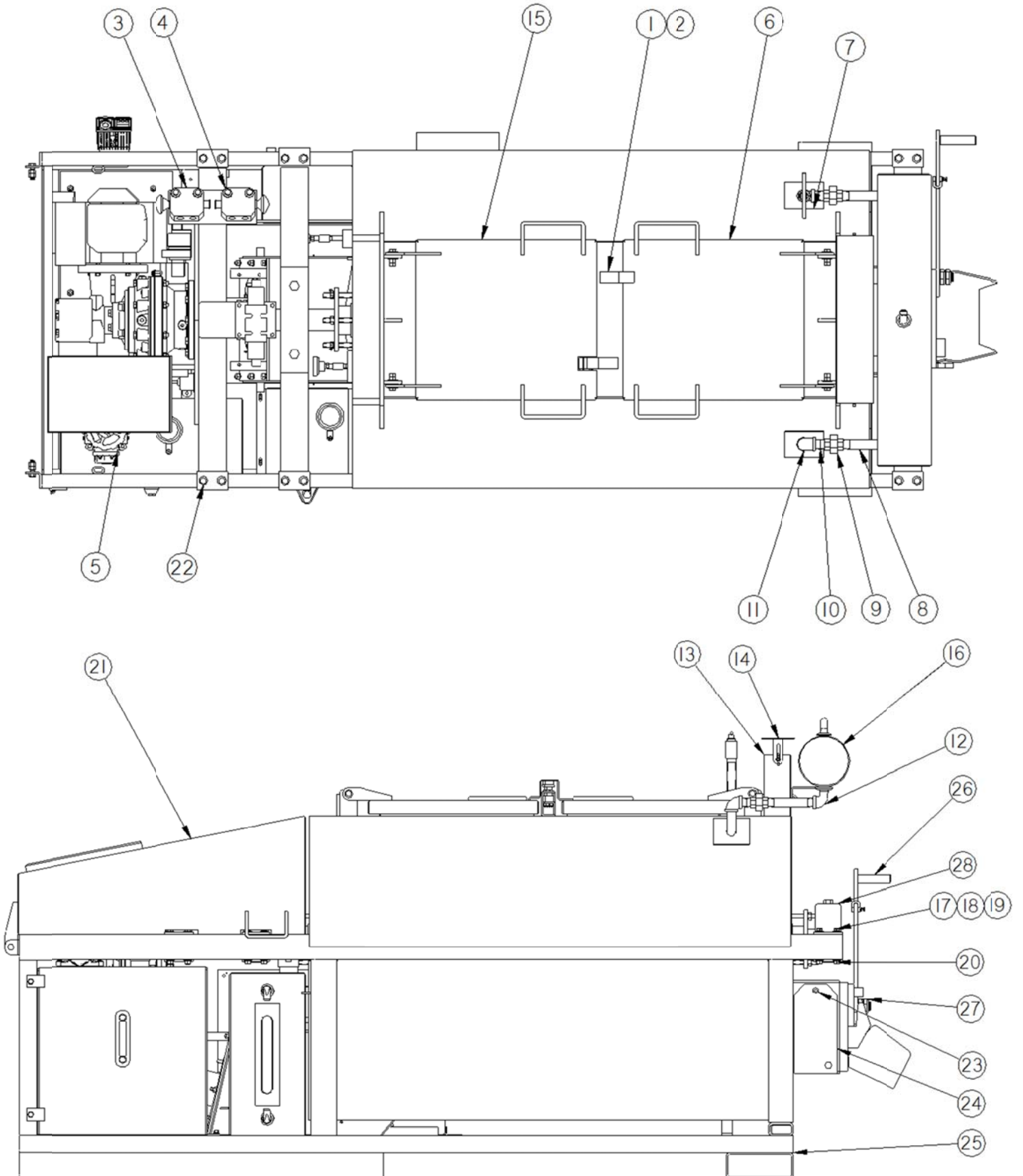
RTD SENSOR - OHMS vs. TEMPERATURE

The following chart shows what the ohm reading would be for a given temperature. The following are the instructions for use.

1. Measure the resistance (Ohms) of the sensor in question with an Ohm meter.
2. Find the reading in the chart.
3. Follow the row to the left and get the temperature in 10° increment, then follow the column up to get the 1° increment. Example: 1573 Ohms =302°

°F	0	1	2	3	4	5	6	7	8	9
0	930.3	932.5	934.7	936.9	939.1	941.3	943.4	945.6	947.8	950.0
10	952.2	954.3	956.5	958.7	960.9	963.0	965.2	967.4	969.6	971.8
20	973.9	976.1	978.3	980.5	982.6	984.8	987.0	989.1	991.3	993.5
30	995.7	997.8	1000.0	1002.2	1004.3	1006.5	1008.7	1010.9	1013.0	1015.2
40	1017.4	1019.5	1021.7	1023.9	1026.0	1028.2	1030.4	1032.5	1034.7	1036.9
50	1039.0	1041.2	1043.4	1045.5	1047.7	1049.8	1052.0	1054.2	1056.3	1058.5
60	1060.7	1062.8	1065.0	1067.1	1069.3	1071.5	1073.6	1075.8	1077.9	1080.1
70	1082.2	1084.4	1086.6	1088.7	1090.9	1093.0	1095.2	1097.3	1099.5	1101.6
80	1103.8	1106.0	1108.1	1110.3	1112.4	1114.6	1116.7	1118.9	1121.0	1123.2
90	1125.3	1127.5	1129.6	1131.8	1133.9	1136.1	1138.2	1140.4	1142.5	1144.7
100	1146.8	1149.0	1151.1	1153.2	1155.4	1157.5	1159.7	1161.8	1164.0	1166.1
110	1168.3	1170.4	1172.5	1174.7	1176.9	1179.0	1181.1	1183.3	1185.4	1187.5
120	1189.7	1191.8	1194.0	1196.1	1198.2	1200.4	1202.5	1204.6	1206.8	1208.9
130	1211.0	1213.2	1215.3	1217.5	1219.6	1221.7	1223.9	1226.0	1228.1	1230.3
140	1232.4	1234.5	1236.7	1238.9	1240.9	1243.0	1245.2	1247.3	1249.4	1251.6
150	1253.7	1255.8	1258.0	1260.1	1262.2	1264.3	1266.5	1268.6	1270.7	1272.8
160	1275.0	1277.1	1279.2	1281.3	1283.5	1285.6	1287.7	1289.8	1292.0	1294.1
170	1296.2	1298.3	1300.4	1302.6	1304.7	1306.8	1308.9	1311.0	1313.2	1315.3
180	1317.4	1319.5	1321.6	1323.8	1325.9	1328.0	1330.1	1332.2	1334.3	1336.5
190	1338.6	1340.7	1342.8	1344.9	1347.0	1349.1	1351.2	1353.4	1355.5	1357.6
200	1359.7	1361.8	1363.9	1366.0	1368.1	1370.2	1372.4	1374.5	1376.6	1378.7
210	1380.8	1382.9	1385.0	1387.1	1389.2	1391.3	1393.4	1395.5	1397.6	1399.7
220	1401.8	1403.9	1406.0	1408.1	1410.3	1412.4	1414.5	1416.6	1418.7	1420.8
230	1422.9	1425.0	1427.1	1429.2	1431.3	1433.4	1435.5	1437.6	1439.6	1441.7
240	1443.8	1445.9	1448.0	1450.1	1452.2	1454.3	1456.4	1458.5	1460.6	1462.7
250	1464.8	1466.9	1469.0	1471.1	1473.2	1475.3	1477.3	1479.4	1481.5	1483.6
260	1485.7	1487.8	1489.9	1492.0	1494.1	1496.1	1498.2	1500.3	1502.4	1504.5
270	1506.6	1508.7	1510.8	1512.8	1514.9	1517.0	1519.1	1521.2	1523.3	1525.3
280	1527.4	1529.5	1531.6	1533.7	1535.7	1537.8	1539.9	1542.0	1544.1	1546.1
290	1548.2	1550.3	1552.4	1554.5	1556.5	1558.6	1560.7	1562.8	1564.8	1566.9
300	1569.0	1571.1	1573.1	1575.2	1577.3	1579.4	1581.4	1583.5	1585.6	1587.7
310	1589.7	1591.8	1593.9	1595.9	1598.0	1600.1	1602.2	1604.2	1606.3	1608.4
320	1610.4	1612.5	1614.6	1616.6	1618.7	1620.8	1622.8	1624.9	1627.0	1629.0
330	1631.1	1633.2	1635.2	1637.3	1639.3	1641.4	1643.5	1645.5	1647.6	1649.7
340	1651.7	1653.8	1655.8	1657.9	1660.0	1662.0	1664.1	1666.1	1668.2	1670.2
350	1672.3	1674.4	1676.4	1678.5	1680.5	1682.6	1684.6	1686.7	1688.7	1690.8
360	1692.9	1694.9	1697.0	1699.0	1701.1	1703.1	1705.2	1707.2	1709.3	1711.3
370	1713.4	1715.4	1717.5	1719.5	1721.6	1723.6	1725.7	1727.7	1729.8	1731.8
380	1733.9	1735.9	1737.9	1740.0	1742.0	1744.1	1746.1	1748.2	1750.2	1752.3
390	1754.3	1756.3	1758.4	1760.4	1762.5	1764.5	1766.6	1768.6	1770.6	1772.7
400	1774.7	1776.8	1778.8	1780.8	1782.9	1784.9	1786.9	1789.0	1791.0	1793.1
410	1795.1	1797.1	1799.2	1801.2	1803.2	1805.3	1807.3	1809.3	1811.4	1813.4
420	1815.4	1817.5	1819.5	1821.5	1823.6	1825.6	1827.6	1829.6	1831.7	1833.7
430	1835.7	1837.8	1839.8	1841.8	1843.8	1845.9	1847.9	1849.9	1851.9	1854.0
440	1856.0	1858.0	1860.0	1862.1	1864.1	1866.1	1868.1	1870.2	1872.2	1874.2
450	1876.2	1878.2	1880.3	1882.3	1884.3	1886.3	1888.3	1890.4	1892.4	1894.4
460	1896.4	1898.4	1900.5	1902.5	1904.5	1906.5	1908.5	1910.5	1912.6	1914.6
470	1916.6	1918.6	1920.6	1922.6	1924.6	1926.6	1928.7	1930.7	1932.7	1934.7
480	1936.7	1938.7	1940.7	1942.7	1944.7	1946.8	1948.8	1950.8	1952.8	1954.8
490	1956.8	1958.8	1960.8	1962.8	1964.8	1966.8	1968.8	1970.8	1972.8	1974.8
500	1976.8	1978.8	1980.8	1982.9	1984.9	1986.9	1988.9	1990.9	1992.9	1994.9
510	1996.9	1998.9	2000.9	2002.9	2004.9	2006.9	2008.8	2010.8	2012.8	2014.8
520	2016.8	2018.8	2020.8	2022.8	2024.8	2026.8	2028.8	2030.8	2032.8	2034.8
530	2036.8	2038.8	2040.8	2042.8	2044.7	2046.7	2048.7	2050.7	2052.7	2054.7
540	2056.7	2058.7	2060.7	2062.7	2064.6	2066.6	2068.6	2070.6	2072.6	2074.6
550	2076.6	2078.5	2080.5	2082.5	2084.5	2086.5	2088.5	2090.4	2092.4	2094.4

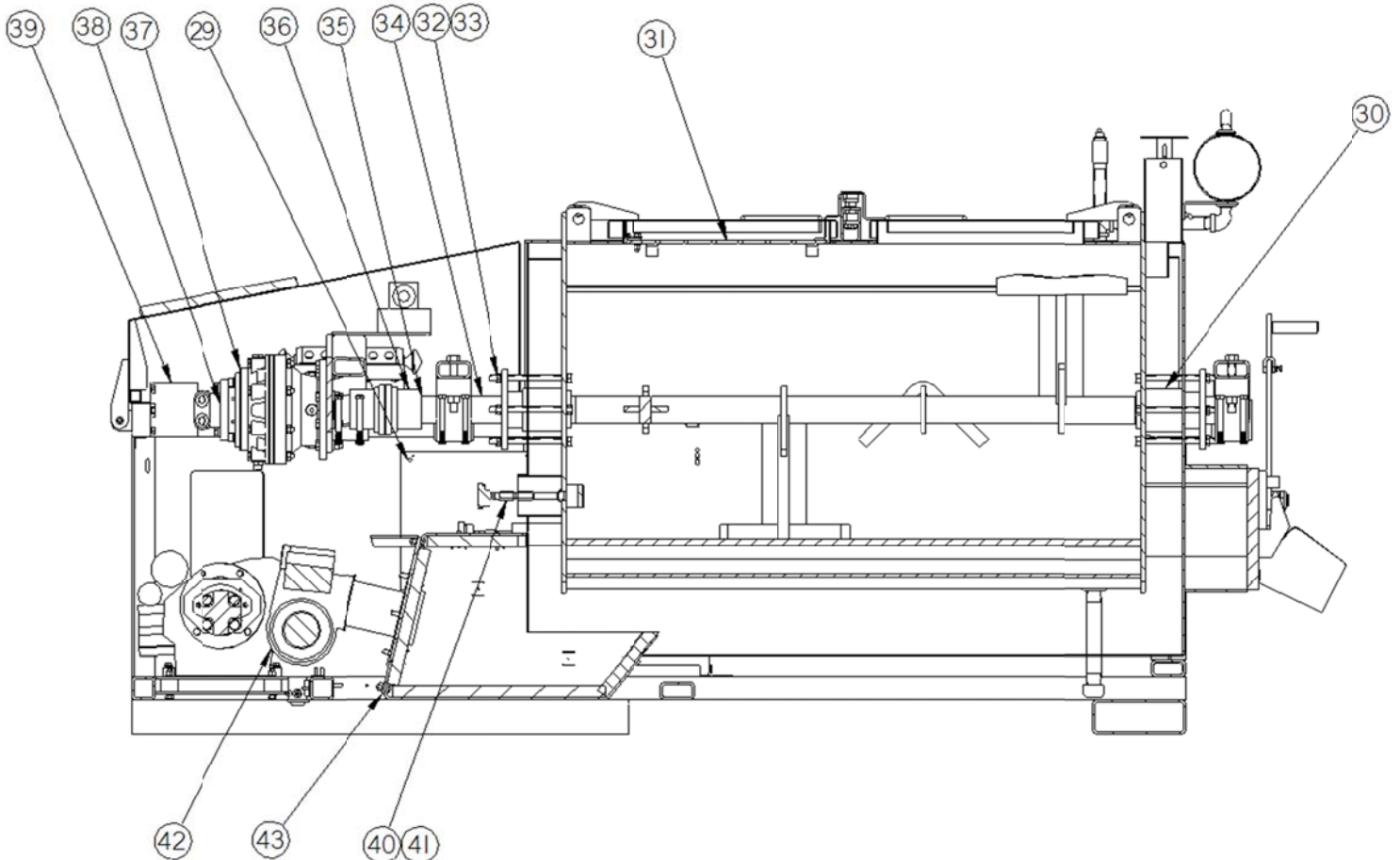
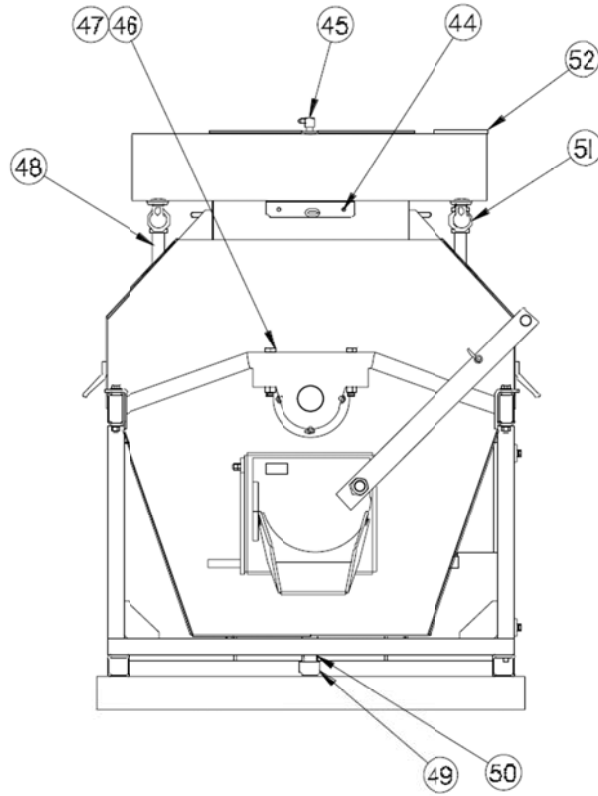
Patcher I Diesel



Patcher I Diesel

NUMBER	PART NUMBER	QTY	DESCRIPTION
1	39608	2	SWITCH - SAFETY (IF EQUIPPED)
2	56362	2	BRACKET - SWITCH
3	56317	2	SELECTOR VALVE
4	28735	4	BOLT, HEX 3/8-16 X 2
5	56310	1	HYD TANK ASSEMBLY - TECHCRETE
6	56237	1	TANK LID ASSEMBLY
7	56330	2	COVER, OVERFLOW PIPE
8	28071	2	3/4" X 6" PIPE NIPPLE
9	28329	2	3/4" PIPE UNION
10	28004	2	3/4" CLOSE NIPPLE
11	28209	1	3/4" 90 DEG. ELBOW
12	28239	2	3/4" ELBOW
13	56270	1	EXHAUST DUCT ASSEMBLY
14	56797	1	VENT COVER ASSY
15	56370	1	MODIFIED LID ASSEMBLY
16	56252	1	OVERFLOW TANK ASSEMBLY
17	56293	2	BEARING, PILLOW BLOCK - 60 MM
18	28648	21	7/16" LOCK WASHER
19	28745	10	7/16"-14 X 4" BOLT
20	28503	33	NUT, HEX HEAD 7/16"-14
21	56325	1	HOOD ASSEMBLY
22	28756	2	7/16"-14 X 4-1/2" BOLT
23	28502	10	NUT, HEX HEAD 3/8-16
24	56350	1	TORCH ACCESS DOOR ASSEMBLY
25	56905	1	FRAME PATCHER I DIESEL
26	56359	1	DOOR SWING GATE ASSEMBLY
27	28520	2	1"-8 JAM NUT
28	56240	2	BEARING SUPPORT ASSEMBLY

Patcher I Diesel



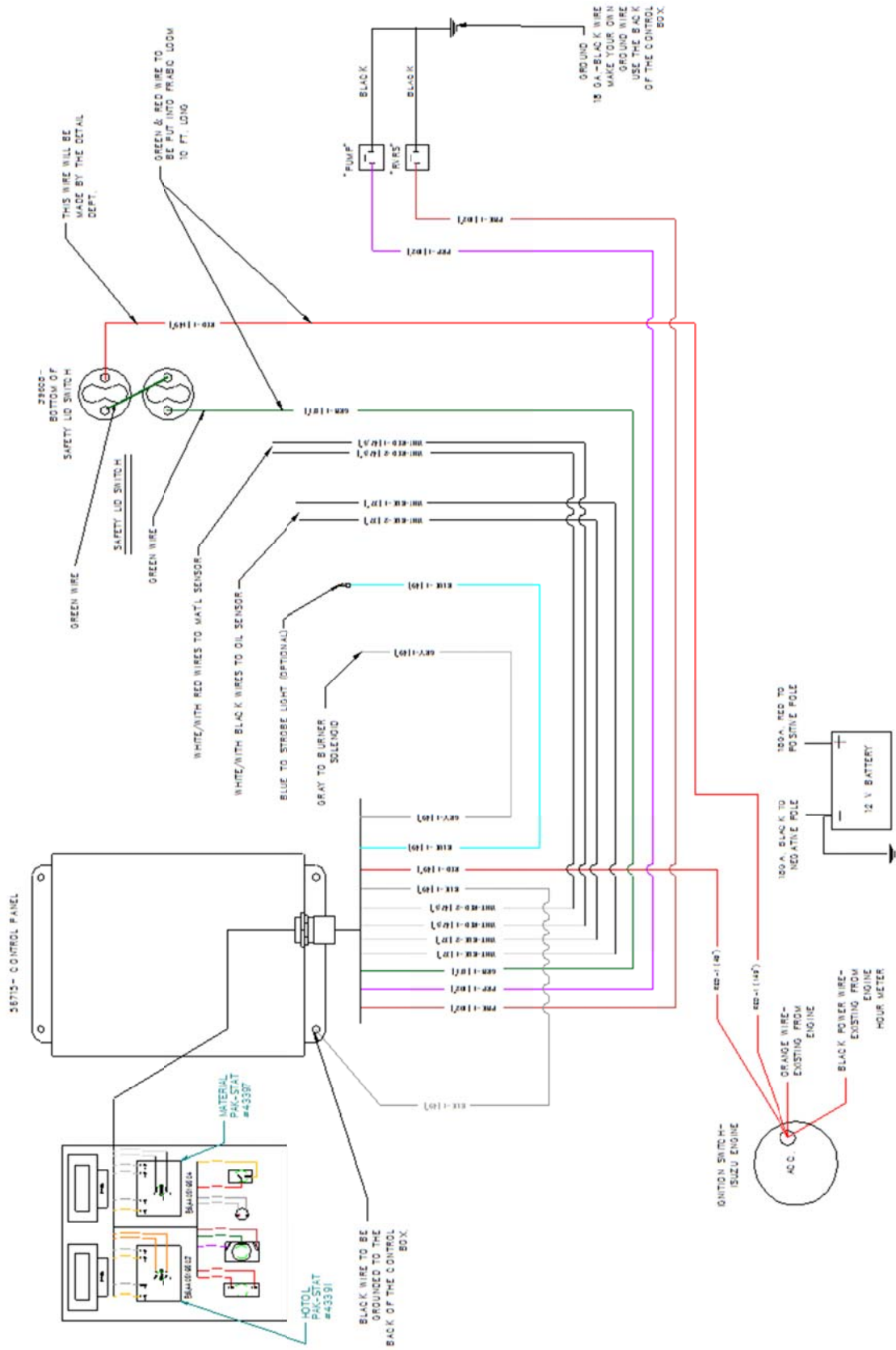
Patcher I Diesel

NUMBER	PART NUMBER	QTY	DESCRIPTION
29	56288	1	PLATE, CONTROL MOUNTING
30	32226	2	MIXER GLAND PACKING
31	56365	1	GRID ASSEMBLY
32	28504	8	1/2"-13 HEX NUT
33	56290	2	PACKING GLAND ASSEMBLY
34	56903	1	TANK, ASSY PATCHER I DIESEL
35	56332	1	KEY-18MM X 11MM X 90MM LONG
36	56334	1	COUPLING HALF - GEAR BOX
37	56203	1	6-1 GEARBOX ASSEMBLY
38	56244	1	ADAPTER COUPLING GEAR BOX (HYD.)
39	42574	1	MIXER MOTOR
40	28001	1	1/4" CLOSE NIPPLE
41	28176	2	1/4" COUPLING
42	46380	1	BURNER ASSEMBLY
43	43110	1	ANGLED DIESEL BURNER BOX
44	56255	1	ANGLE, OVERFLOW TANK SUPPORT
45	29845	1	90 DEG. ELBOW
46	28541	4	5/8"-11 UPSET LOCKNUT
47	28782	4	5/8"-11 X 4" BOLT
48	56264	2	NIPPLE, 3/4 X 13 LONG
49	28270	1	1" PIPE CAP
50	28101	1	1" X 8" PIPE NIPPLE
51	28254	1	3/4 NPT TEE
52	56326	1	H.O. DIPSTICK ASSEMBLY

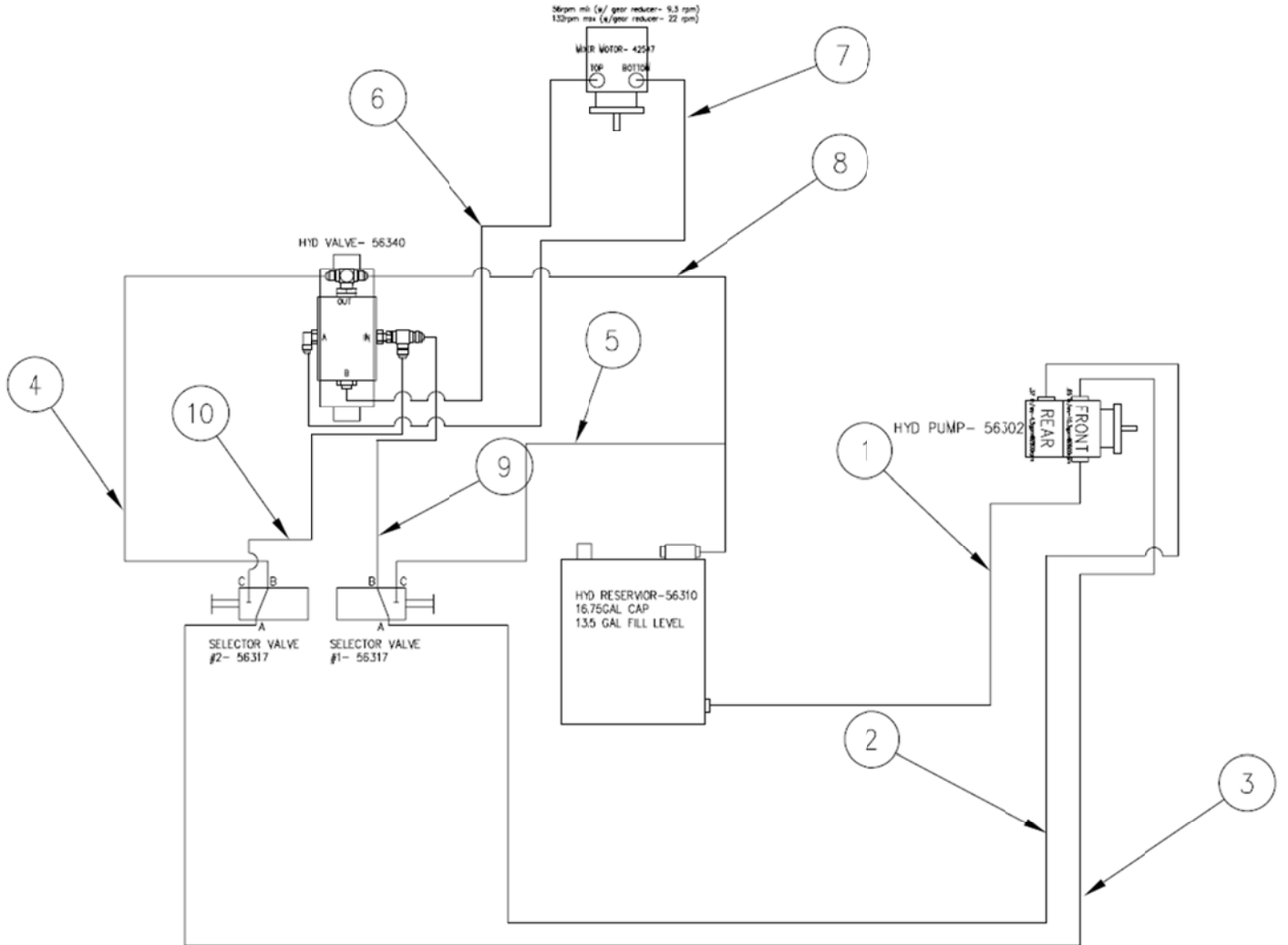
Patcher I Diesel

NUMBER (Not Shown)	PART NUMBER	QTY	DESCRIPTION
NS	56302	1	HYDRAULIC PUMP
NS	56340	1	HYDRAULIC VALVE
NS	45498	1	HYDRAULIC FILTER ASSEMBLY HOUSING
NS	56941	1	ENGINE, KOHLER 9.1 HP
NS	56715	1	CONTROL BOX ASSEMBLY
NS	44829	1	COUPLING HALF 1"
NS	44830	1	SPIDER FOR COUPLING
NS	56303	1	COUPLING HALF
NS	44806	1	ADAPTER, PUMP MOUNT
NS	43465	1	RTD SENSOR - 18" STEM
NS	55120	1	RTD SENSOR - 2" STEM
NS	32243	1	IRON
NS	32246	1	SCRAPER
NS	32276	1	TOOL HEATER BOX
NS	32263	1	BUCKET
NS	32258	1	TANK SCRAPER
NS	56202	1	PATCHER I TRAILER (OPTIONAL)

Patcher I Diesel ELECTRICAL SCHEMATIC PART # 26566



Patcher I Diesel HYDRAULIC DIAGRAM Kit Part # 26565



**Patcher I Diesel
HYDRAULIC PARTS
Kit Part # 26565**

1. HYDRAULIC RESERVOIR TO HYDRAULIC PUMP (SUCTION)		
1	29901	#12JIC X #16 MP STR ADAPTER
1	12G4H 12G-12FJX 12G-12FJX90S 29 24.5	SUCTION HOSE
1	29978	#12 TUBE X #16 O-RING-90°ADAPTOR
2. HYDRAULIC PUMP "REAR PORT" TO SELECTOR VALVE #1		
1	29828	#10 O-RING X #6 JIC 90° FITTING
1	6M3K 6G-6FJX 6G-6FJX90S 36 32.75	3/8 X 36" HYDRAULIC HOSE
1	29841	FITTING, STRAIGHT MALE 6MJ X 8MP
3. HYDRAULIC PUMP "FRONT PORT" TO SELECTOR VALVE #2		
1	29828	90° O-RING ADAPTER
1	6M3K 6G-6FJX 6G-6FJX90S 34 30.75	3/8 X 34" HYDRAULIC HOSE
1	29841	#8 MP X #6 JIC STR ADAPTER
4. SELECTOR VALVE #2 TO OUTLET PORT HYDRAULIC VALVE		
1	29844	#8 MP X #8 JIC STR ADAPTER
1	8M3K 8G-8FJX 8G-8FJX 23 20	1/2 X 23" HYDRAULIC HOSE
1	29912	SWIVEL NUT BRANCH "T" #8
1	29913	#10 O-RING X #8 JIC STR ADAPTER
5. SELECTOR VALVE #1 TO HYDRAULIC RESERVOIR (RETURN)		
1	29844	#8 MP X #8 JIC STR ADAPTER
1	8M3K 8G-8FJX90S 8G-8FJX 26 22.5	1/2 X 26" HYDRAULIC HOSE
1	29865	#8 X #8 X #8MP "RUN TEE"
1	29991	3/4 TUBE X 1 1/4" O-RING
1	29816	1/2 TUBE X 3/4" TUBE REDUCER

**Patcher I Diesel
HYDRAULIC PARTS
Kit Part # 26565**

6. HYDRAULIC VALVE "B" PORT TO HYDRAULIC MOTOR TOP PORT		
1	22029	#10 O-RING X #6 JIC STR ADAPTER
1	6M3K 6G-6FJX 6G-6FJX90S 22 18.75	3/8 X 22" HYDRAULIC HOSE
1	29828	5/8 O-RING X 3/8 TUBE 90° ADAPTOR
7. HYDRAULIC VALVE "A" PORT TO HYDRAULIC MOTOR BOTTOM PORT		
1	29828	5/8 O-RING X 3/8 TUBE 90° ADAPTOR
1	6M3K 6G-6FJX 6G-6FJX90L 27 24	3/8 X 27" HYDRAULIC HOSE
1	29828	5/8 O-RING X 3/8 TUBE 90° ADAPTOR
8. HYDRAULIC VALVE OUTLET TO HYDRAULIC RESERVOIR (RETURN)		
1	8M3K 8G-8FJX90S 8G-8FJX 24 20.5	1/2 X 24" HYDRAULIC HOSE
9. SELECTOR VALVE #1 TO HYDRAULIC VALVE INLET		
1	6M3K 6G-6FJX 6G-8MP 18 15.25	3/8 X 18" HYDRAULIC HOSE
10. SELECTOR VALVE #2 TO HYDRAULIC VALVE INLET		
1	6M3K 6G-6FJX 6G-8MP 18 15.25	3/8 X 18" HYDRAULIC HOSE
1	29866	SWIVEL NUT RUN "T" #6
1	22029	#10 O'RING X #6 JIC STR ADAPTER

**Patcher I Diesel
NOTES**



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