

Hydraulic Motors

Repair Instructions

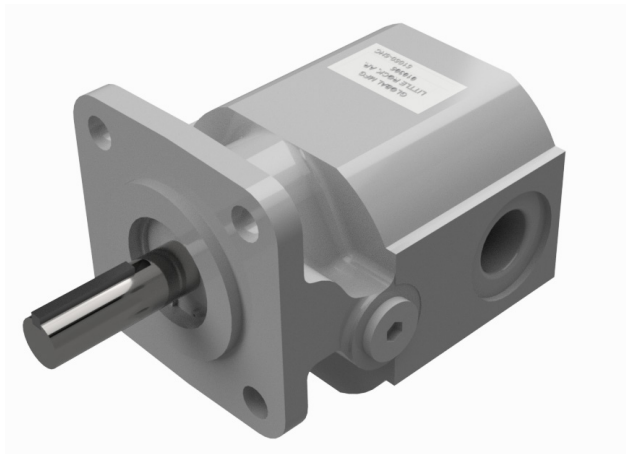
Motors for Global® External
Hydraulic Vibrators

Models

2HC - pn #251020

5HC - pn #251050

***2HM Motor is pn 251030.
Contact the factory if you
need to repair model 2HM.***



V I B R A T O R S



V I B R A T O R S



A I R B L A S T E R S

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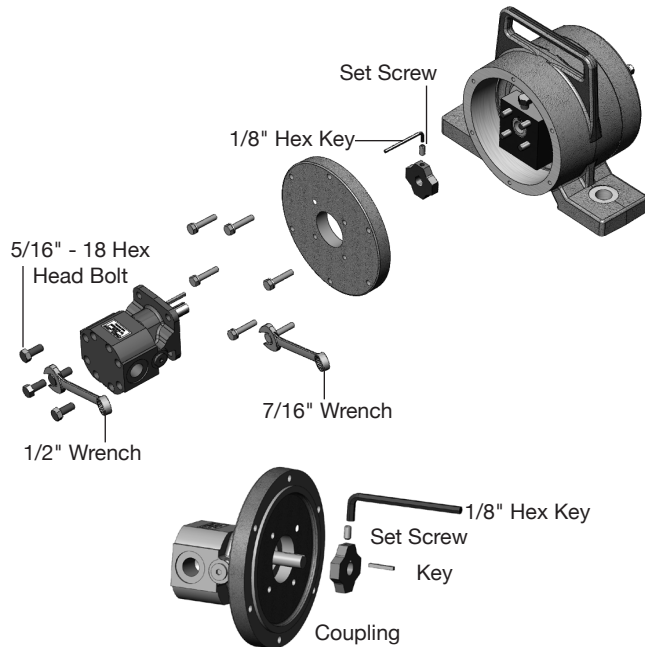
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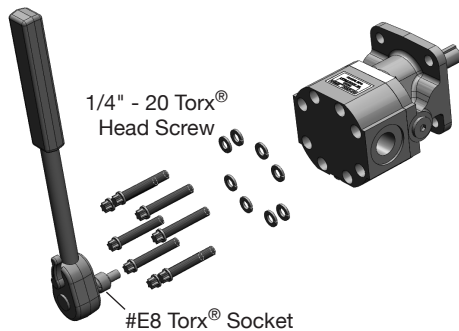
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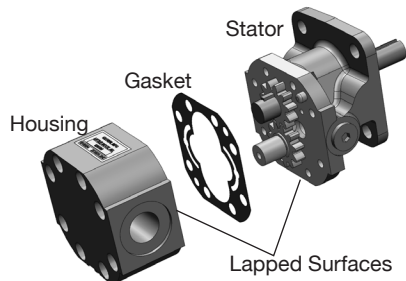
Rebuilding Hydraulic Motor



1. Remove the six 1/4" - 20 screws from the motor cover with a 7/16" wrench. Remove the set screw from the coupling with a 1/8" hex key. Slide the coupling and key from the motor shaft. Now remove the four motor screws with a 1/2" wrench. This is best done by "breaking" the bolts loose while the cover is still mounted on the housing.



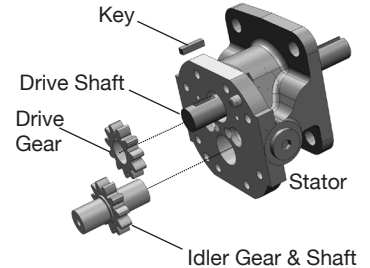
2. Remove eight Torx[®] head screws from the motor housing using a #E8 Torx[®] socket.



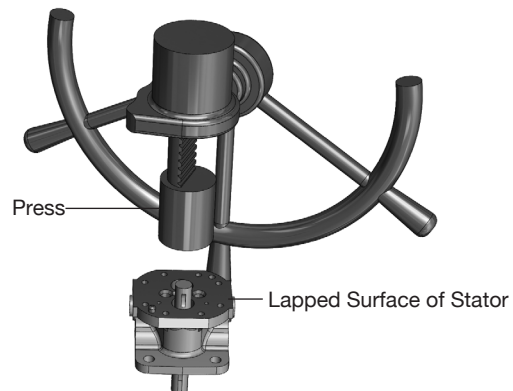
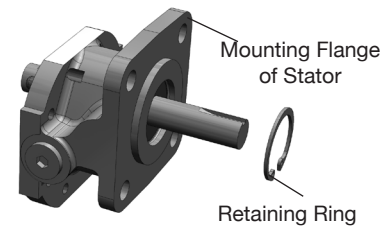
3. Separate the housing from the stator. **Note: Do not damage the lapped surfaces of the housing and stator.** Do not damage gasket if not replacing. Discard used

gasket if one is available. Important - replace gasket with the same color gasket. Gasket colors are different due to tolerance gaps and must be matched to get a proper seal.

4. Remove the idler gear and shaft. Slide the drive gear off the shaft and remove the key.

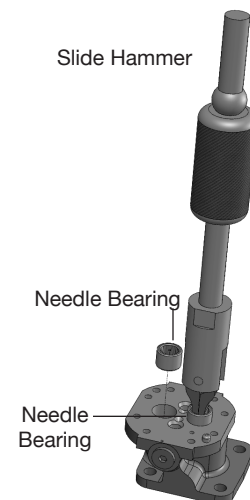


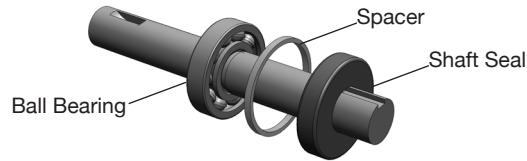
5. Turn the stator around and remove the retaining ring from the shaft seal bore using the retaining ring pliers.



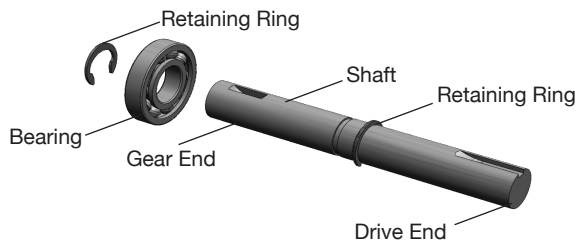
6. Support the stator on its flange and press the shaft out of the stator with an arbor press. Note: Do not allow press to contact the lapped surface of the stator. When the seal has been pressed out of the bore, the shaft and bearing should fall out of the stator. Discard damaged shaft seal.

7. To replace the needle bearings, use a slide hammer and collet to pull them out of housing and stator. Gently press new needle bearings into the bearing bores using a 5/8" rod until they stop in the motor housing. **Be careful not to damage the lapped surface.**

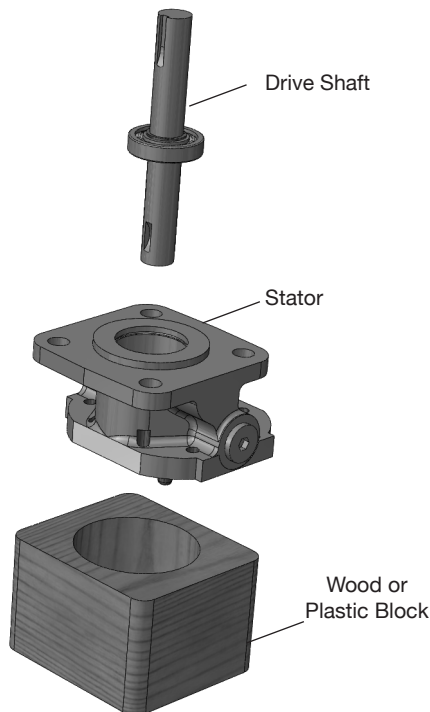




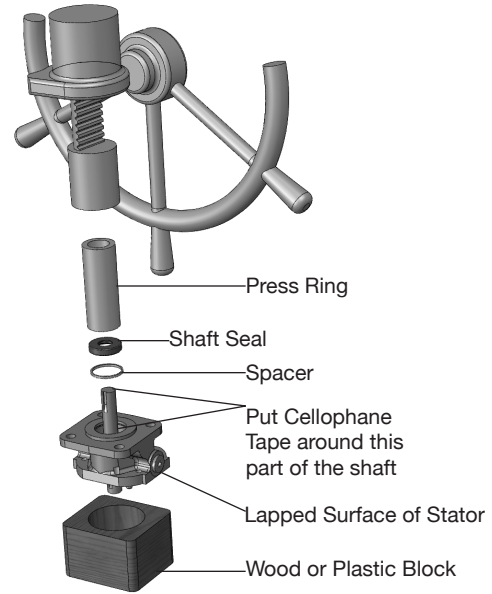
8. Slide the seal off the drive end of the shaft. To replace ball bearing, remove retaining ring. The ball bearing **must** be pressed off the **gear end** of the shaft to avoid scratching the shaft. Replace shaft if it is scratched.



9. Install a retaining ring in the groove nearest the drive end. The ball bearing **must** be pressed onto the shaft from the **gear end**. Be careful not to scratch shaft especially seal area. (Even the smallest scratch can cause a leak under high pressure.) Press only against the inner race of the bearing, using a 1/2" ID X 3" long pipe.

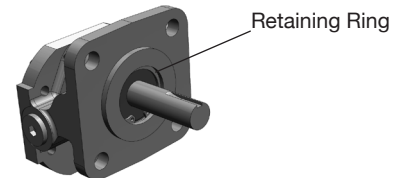


10. Support the lapped surface of the stator with a block of soft material. Slide the shaft and ball bearing into the stator. This is a close fit and may require a very light press.

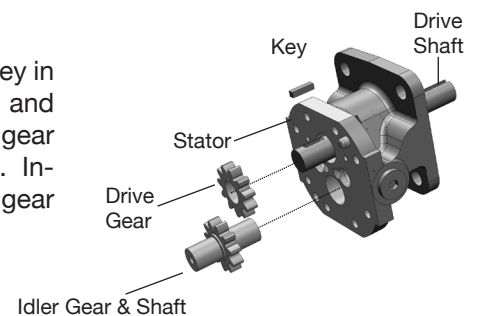


11. The shaft seal is **very delicate** and if damaged the motor will leak. Thoroughly clean the shaft and bore in the stator. **Wrap thin cellophane tape around the end of the shaft completely covering the keyway (this is very important because the keyway can nick the shaft seal if not covered).** Spread a little oil around the lip of the seal and slide the seal down the shaft. Use a 1" OD X 2" long pipe to press the seal into the bore deep enough so that the retaining ring can be installed.

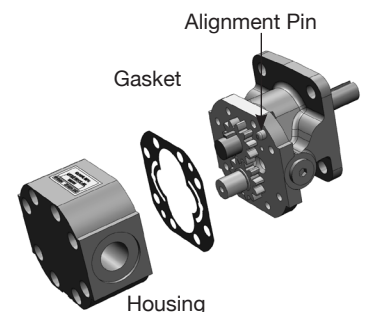
12. Install a retaining ring in the bore of the shaft seal.



13. Place the key in the drive shaft and slide the drive gear on to the shaft. Install the idler gear and shaft.

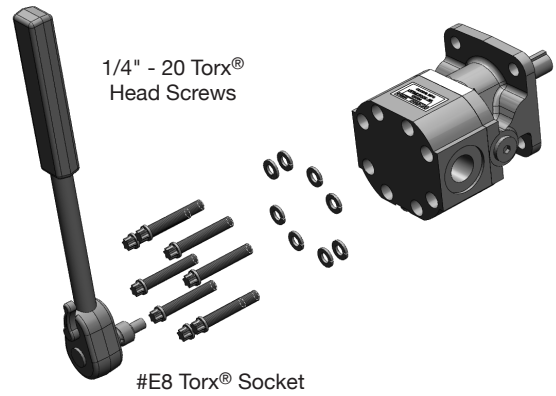


14. Carefully place gasket onto lapped surface of housing or stator. Align holes and smooth gasket completely flat. (A little oil helps to keep gasket in place.)



15. Place the housing on the stator using the shear pins for alignment. Insert eight Torx[®] head screws into the housing and tighten to 9.5 - 10.5 ft. lbs. (12.0 - 14.2 Nm) in a crisscross pattern. If the screws are too tight the gears will bind, and if the screws are too loose oil will leak around the gears.

16. Attach the motor to the cover and reassemble the vibrator according to the assembly instructions starting on page 10.

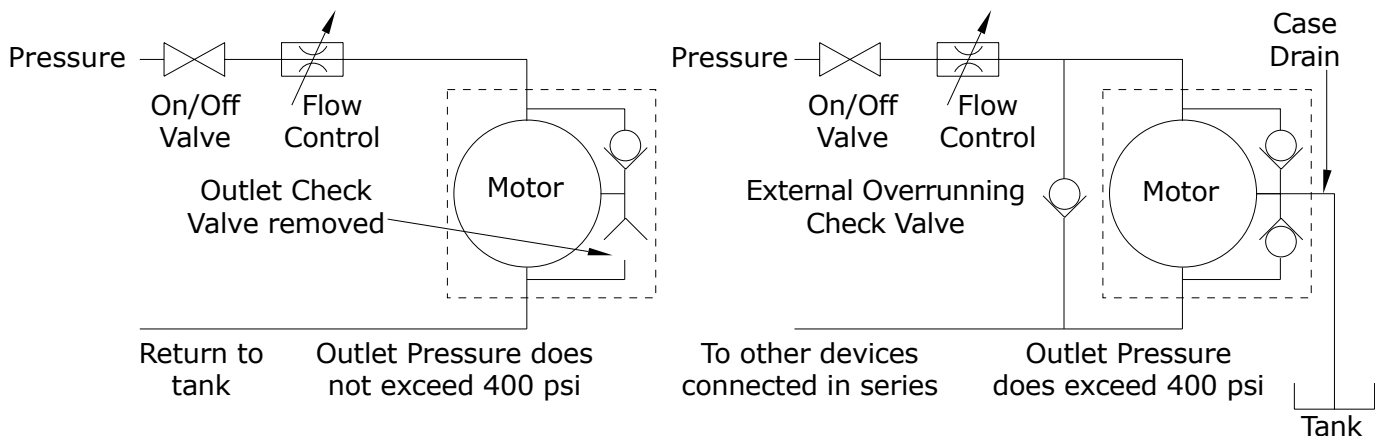


Hydraulic Motor Data

Standard Hydraulic Motor Performance Data - 2HC and 5HC Motors

Motor	Port Size SAE	Minimum Hose Size I.D.	Displacement per Revolution	Max Speed RPM	Flow Rate at Maximum Speed	Maximum Continuous Pressure	Maximum Intermittent Pressure	Maximum Back Pressure
2HC	3/4" -16	1/2"	.129 cu in	5000	2.8 GPM	3000 psi	4000 psi	400 psi
			2.11 cc		12.7 LPM	207 bar	276 bar	27 bar
5HC	3/4" -16	5/8"	.388 cu in	5000	8.4 GPM	1600 psi	2500 psi	400 psi
			6.36 cc		38 LPM	110 bar	172 bar	27 bar

Plumbing Diagram

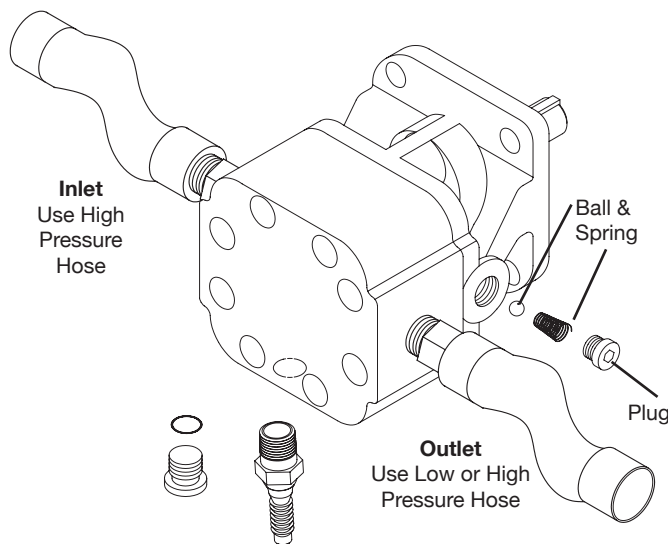


Important!

Overrunning Condition

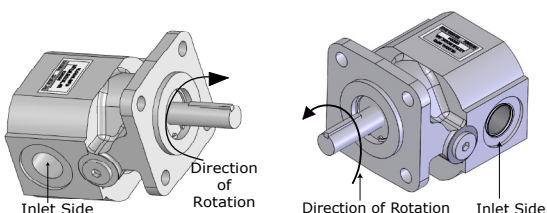
The heavy eccentric weights act like a fly wheel that continue rotating the motor shaft when the hydraulic flow is shut off. It is important to allow the vibrator to wind down slowly to prevent damage to the motor and to prolong the life of the vibrator. This can be done by removing the ball and spring (check valve) on the return side (outlet) of the motor. For clockwise rotation remove the plug from the return side of the motor as shown in the diagram below using a 3/16" allen wrench. Remove the ball and spring and replace the plug. For counter clockwise rotation remove the ball and spring from the opposite side and switch the inlet and return hoses. **A check valve must always be installed on the inlet side of the motor.**

When the outlet check valve is removed, the motor is not bi-rotational. If the vibrator must be run in the opposite direction, the inlet check valve (ball & spring) must be moved to the opposite side, so that, there is always a check valve on the inlet side.



Bidirectional Motors

The motors of the Design Series vibrators are bidirectional; therefore the eccentric weight rotation can be reversed by changing the hose connections. (Change the inlet to the outlet and the outlet to the inlet.)

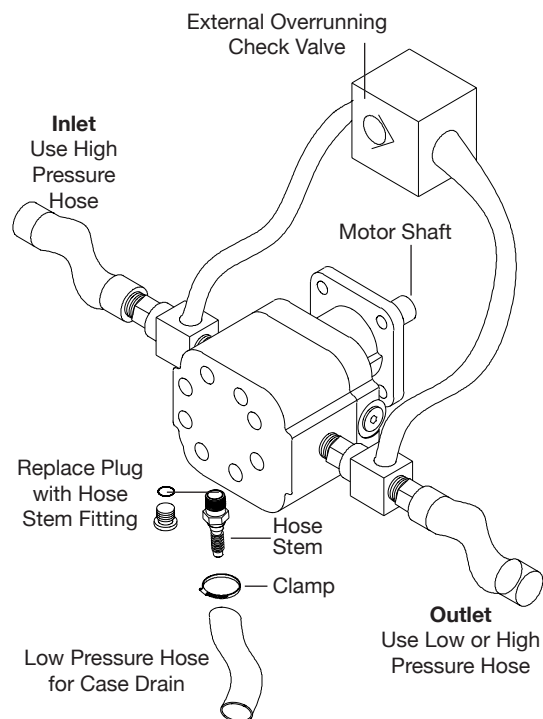


Case Drain

In most applications a case drain is not required, because the case pressure is relieved through the check valve connected to the outlet port. However, the VITON shaft seal in the motor will fail if the case pressure exceeds 400 psi. If the case pressure exceeds 400 psi, the back pressure on the seal will exceed 400 psi and the seal will blow. The seal is rated for a maximum back pressure of 400 psi. Therefore, if the back pressure or pressure spikes at the outlet port exceed 400 psi a case drain must be run back to the tank.

We often find the motor has been given too much flow (GPM.), which causes the motor seal to blow. Check the inlet flow and adjust accordingly. You may not need a case drain if the motor has the right amount of GPM

To install the case drain, remove the case drain plug and install a hose stem that has 7/16"-20 threads and o-ring. Clamp a low pressure hose to the stem and run it directly back to the tank. **DO NOT remove either of the check valves when a case drain is installed.** Instead install an external overrunning check valve to allow the vibrator to wind down slowly.

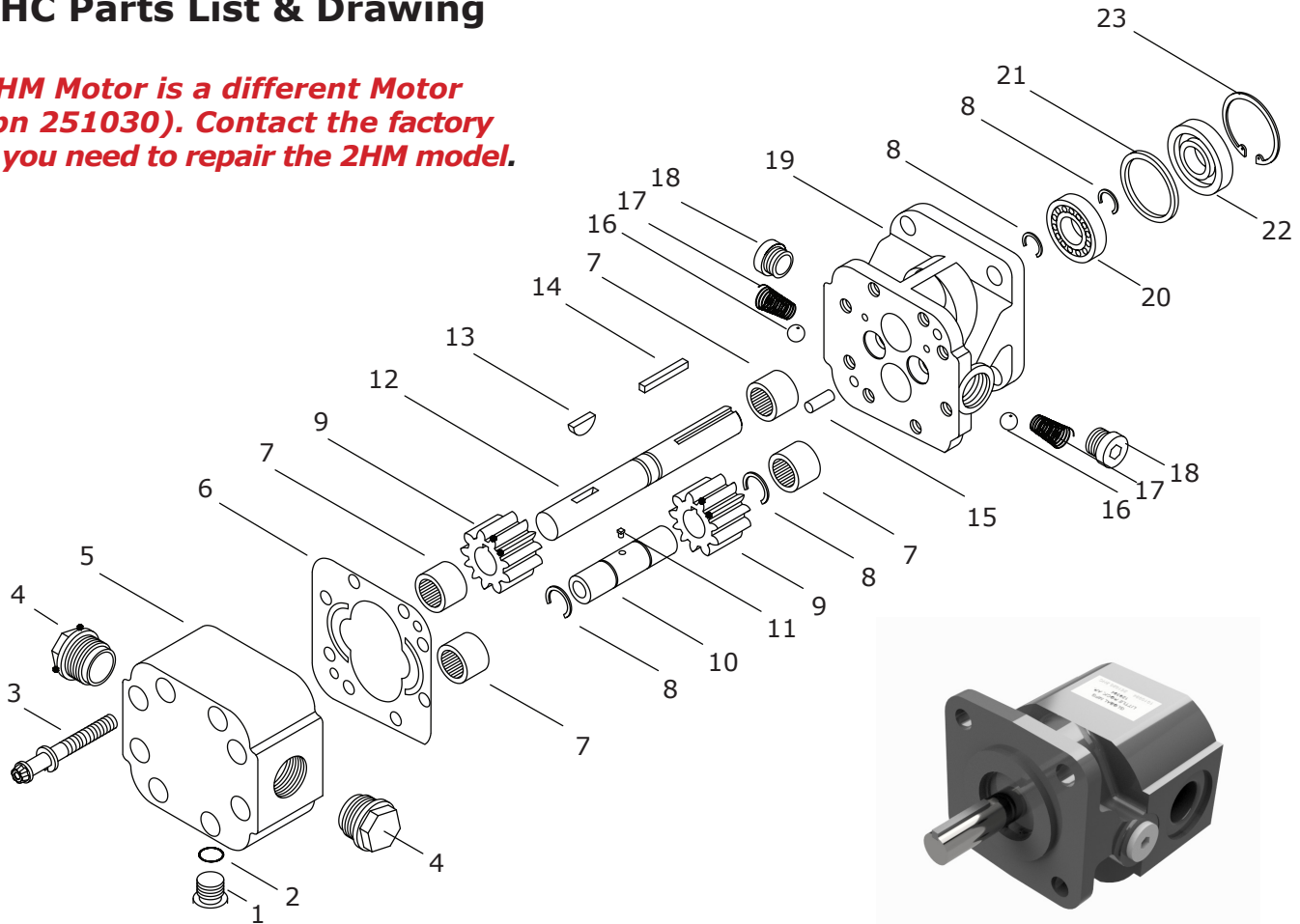


Pipes & Hose Sizes

Use an inlet hose that is the same size or larger in diameter as the inlet port of the vibrator. Use a short, flexible hose between the vibrator and the main hydraulic line if the main line is metal to avoid strain on the vibrator motor ports. Allow a loose bend of 9" to 16" (23 cm to 41 cm) to be formed by the hose to prevent cracking from vibration. Use a return hose at least one size larger than the inlet hose.

2HC Parts List & Drawing

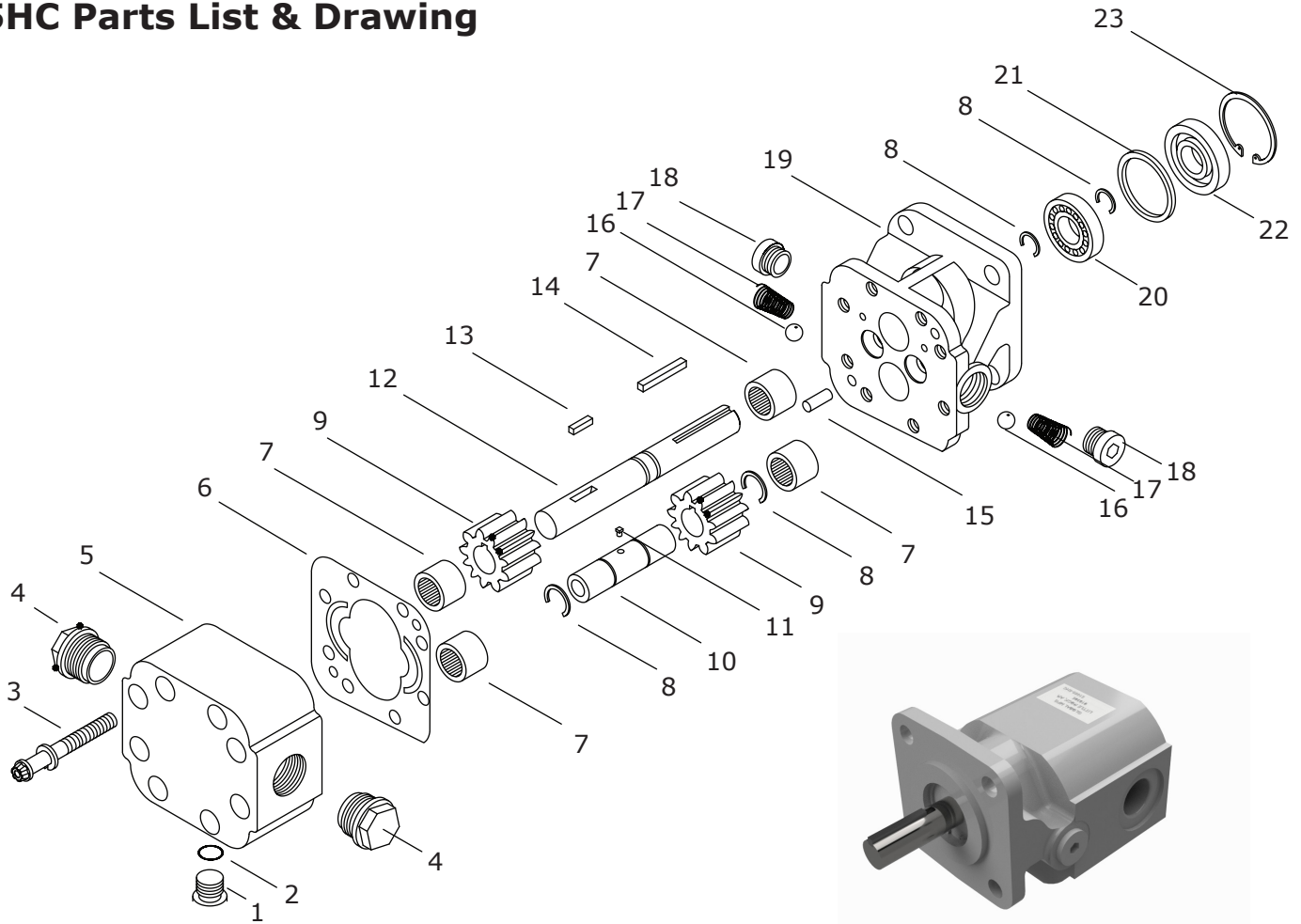
2HM Motor is a different Motor (pn 251030). Contact the factory if you need to repair the 2HM model.



Parts List for 2HC Hydraulic Motor - Part Number 251020

#	Description	Part #	Qty	#	Description	Part #	Qty
1	Plug, Steel .43 SAE Soc. Hd.	257413	1	16	Nylon Ball .375 Diameter	K2	2
2	O-Ring	N/A	1	17	Spring	K2	2
3	Screw 1/4"- 20 x 1 1/2"	257230 or K2	8	18	Steel Plug .50 SAE Soc. Hd.	K2	2
4	Plug, Plastic 3/4" - 16 SAE	N/A	2	19	Stator	N/A	1
5	Gear Housing	N/A	1	20	Ball Bearing	K1	1
6	Gasket	K1	1	21	Spacer	K2	1
7	Needle Bearing	K1	4	22	Oil Seal	254025 or K1	1
8	Crescent Ring, External	K2	4	23	Retaining Ring, Internal	347112	1
9	Gear	257120	2	Repair Kits		Part #	
10	Idler Shaft	K2	1	K1	HMRK#1 - 2/5HC	251125	
11	Drive Pin	K2	1	K2	HMRK#2 - 2HC	252020	
12	Drive Shaft	257020	1	•	Gasket Kit 2/5HC	251025	
13	Woodruff Key	K2	1	Gasket Kit includes 5 different colors of gaskets. Gasket color is unknown until the motor is disassembled.			
14	Key, Square 1/8" sq x 1" long	K2	1				
15	Shear Pin	N/A	2				

5HC Parts List & Drawing



Parts List for 5HC Hydraulic Motor - Part Number 251050

#	Description	Part #	Qty	#	Description	Part #	Qty
1	Plug, Steel .43 SAE Soc. Hd.	257413	1	16	Nylon Ball .375 Diameter	K2	2
2	O-Ring	N/A	1	17	Spring	K2	2
3	Screw 1/4" - 20 x 2"	257250 or K2	8	18	Steel Plug .50 SAE Soc. Hd.	K2	2
4	Plug, Plastic 3/4" - 16 SAE	N/A	2	19	Stator	N/A	1
5	Gear Housing	N/A	1	20	Ball Bearing	K1	1
6	Gasket	K1	1	21	Spacer	K2	1
7	Needle Bearing	K1	4	22	Oil Seal	254025 or K1	1
8	Crescent Ring, External	K2	4	23	Retaining Ring, Internal	347112	1
9	Gear	257150	2	Repair Kits		Part #	
10	Idler Shaft	K2	1	K1	HMRK#1 - 2/5HC	251125	
11	Drive Pin	K2	1	K2	HMRK#2 - 5HC	252050	
12	Drive Shaft	257050	1	•	Gasket Kit 2/5HC	251025	
13	Key, Square 1/8" sq x 1/2" long	K2	1	Gasket Kit includes 5 different colors of gaskets. Gasket color is unknown until the motor is disassembled.			
14	Key, Square 1/8" sq x 1" long	K2	1				
15	Shear Pin	N/A	2				