SERVICE MANUAL

H70-110XL, H90XLS (F005)
H70-110XL, H90XLS (G005)



FORM 897135 Rev. 02/04

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Section	SRM Number	Rev Date
FRAME	0100 SRM 0345	05/95
GM V6-4.3L ENGINE (CARBURETED)	0600 SRM 0104	09/93
GM V6-4.3L ENGINE (CARBURETED)	0600 SRM 0105	06/97
PERKINS DIESEL ENGINE-1000 SERIES	0600 SRM 0412	08/97
GM V6-4.3L ENGINE WITH FUEL INJECTION	0600 SRM 0590	11/03
PERKINS DIESEL ENGINE-1000 SERIES (AR, YG, YH)	0600 SRM 0705	09/03
COOLING SYSTEM	0700 SRM 0626	11/01
WEBER CARBURETOR WITH GOVERNOR	0900 SRM 0347	12/92
LPG FUEL SYSTEM	0900 SRM 0348	09/01
OIL CLUTCH SYSTEM	1200 SRM 0334	11/97
THREE-SPEED MANUAL TRANSMISSION	1300 SRM 0335	02/04
SINGLE-SPEED PS TRANS-DESCR / OPER	1300 SRM 0336	02/97
SINGLE-SPEED PS TRANSMISSION-REPAIR	1300 SRM 0337	02/97
SPEED REDUCER and DIFFERENTIAL	1300 SRM 0346	03/97
DRIVE AXLE	1400 SRM 0361	03/97
STEERING CONTROL UNIT	1600 SRM 0054	10/03
STEERING AXLE	1600 SRM 0326	10/03
BRAKE SYSTEM	1800 SRM 0338	07/00
HYDRAULIC GEAR PUMPS	1900 SRM 0097	10/03
HYDRAULIC SYSTEM	1900 SRM 0333	03/97
HYDRAULIC PUMP DRIVE ASSEMBLY	1900 SRM 0339	10/03
MAIN CONTROL VALVE	2000 SRM 0077	07/00
TILT CYLINDERS	2100 SRM 0103	10/03
ALTERNATOR	2200 SRM 0002	10/03
STARTER	2200 SRM 0106	02/01
HIGH ENERGY IGNITION SYSTEM	2200 SRM 0107	03/02
INSTRUMENT PANEL INDICATORS and SENDERS	2200 SRM 0143	12/03
MSTS-GM V6-4.3L (EARLY CONTROL MODULES)	2200 SRM 0463	04/93
MSTS-GM V6-4.3L (LATER CONTROL MODULES)	2200 SRM 0765	11/01
GM V6 ENG CONTROL-DESC/OPER (EARLY MODULES)	2200 SRM 0473	03/94
GM V6 ENGINE CONTROL-REPAIR (EARLY MODULES)	2200 SRM 0468	05/96
GM V6 ENG CONTROL-DESC/OPER (LATER MODULES)	2200 SRM 0781	01/00
GM V6 ENGINE CONTROL-REPAIR (LATER MODULES)	2200 SRM 0782	03/00
LIFT CYLINDERS	4000 SRM 0135	10/03
VISTA MASTS	4000 SRM 0340	09/02
PERIODIC MAINTENANCE	8000 SRM 0341	12/03

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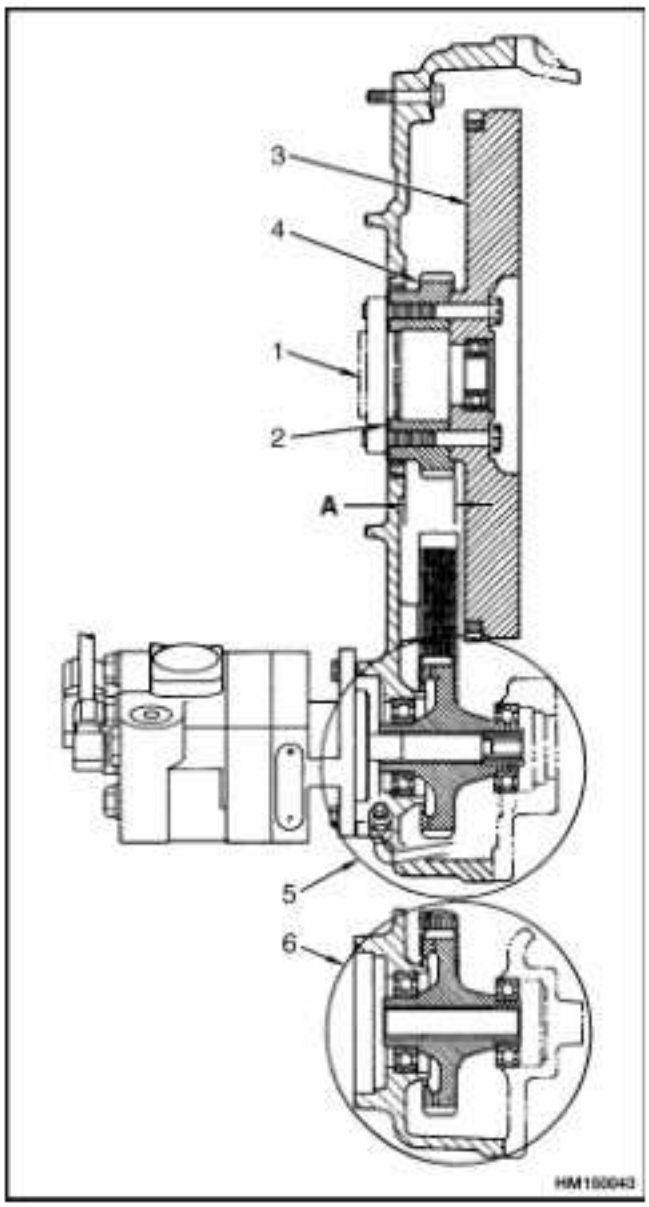


Figure 4. Chain Drive Assembly Parts

Legend for Figure 4

NOTE: NOT ALL UNITS SHOWN. OTHERS SIMILAR.

Model	Dimension A
S/H2.00-3.00XL (S/H40-60XL)	28.5 ±01 mm (1.12 ±0.004 in.) GM
H3.50-5.00XL (H70-110XL)	33.7 ±0.1 mm (1.33 ±0.004 in.) Gas & LPG
S3.50-5.50XL (S70-120XL)	
S3.50-5.50XM (S70-120XM)	33.7 ±0.1 mm (1.33 ±0.004 in.) Gas & LPG
S6.00-7.00XL (S135-155XL, S135-155XL$_2$, S155XLS) (B024, C024)	29.7 ±0.1 mm (1.17 ±0.004 in.) DSL

1. CRANKSHAFT
2. SHIMS
3. FLYWHEEL
4. DRIVE GEAR
5. DRIVEN GEAR ARRANGEMENT (WITH OIL CLUTCH)
6. DRIVEN GEAR ARRANGEMENT (WITH POWERSHIFT TRANSMISSION)

Troubleshooting

Most problems that can occur in the chain drive assembly will cause noise that is not normal. Examples of these problems are as follows: (1) bearing wear, (2) sprocket wear, or (3) leaf chain wear. The leaf chain can also break. If the leaf chain breaks, there will be no pump output. To repair any of these problems, the drive assembly must be disassembled.

One of the hydraulic pumps can also be causing noise. With the unit running, actuate the system to put a load on the pump. If the noise is gone, the hydraulic pump is probably the cause of the noise and not the pump drive assembly.

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Stator Windings Check

To check the stator windings for electrical ground, connect an ohmmeter as shown in Figure 17. There must be no continuity between any of the stator terminals and the metal housing.

To check the stator for open circuits, connect the ohmmeter or test lamp between each pair of wires to the stator as shown in Figure 17. If the test lamp does not illuminate or the meter reading is high, the windings have an open circuit.

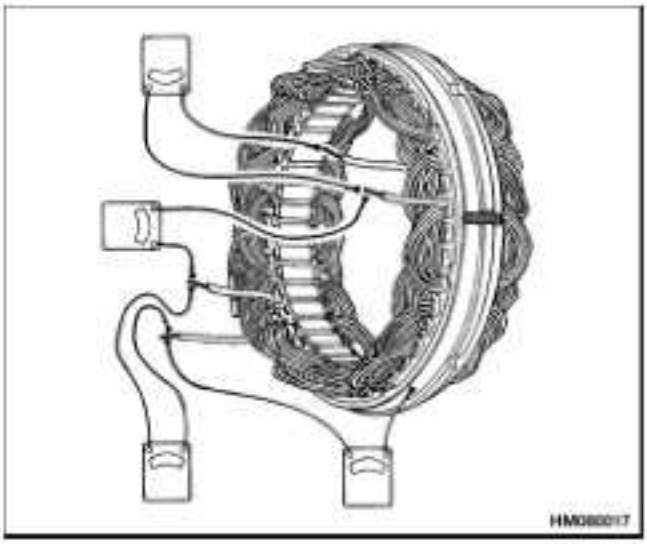


Figure 17. Stator Checks

Voltage Regulator Check

Use a voltage regulator test device. Do not use an ohmmeter. If the voltage regulator has damage, replace the voltage regulator.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	PROCEDURE OR ACTION
Battery is charged above normal.	Alternator is not charging correctly.	Repair or install new parts.
	Electrical ground in wire to brush or clip.	Repair or install new parts.
	High resistance in the circuit.	Repair or install new parts.
Battery uses more water than normal.	Battery is charging more than normal.	Replace voltage regulator.
	Alternator has damage in the field windings, diodes, diode bridge, or stator.	Install new parts.
	Battery has damage or is too old.	Replace battery.

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TOOLS AND TEST EQUIPMENT

The following tools are necessary for troubleshooting the MSTS:

- Digital-Volt-Ohmmeter (DVOM). The voltmeter must have a minimum input impedance of 10-megohms. (A digital voltmeter and ohmmeter are normally included in a multimeter test instrument.)
- Tachometer with inductive trigger signal sensor.
- Test light that has a low current draw as described in Figure 10.
- Vacuum pump with a gauge. This vacuum pump is held and operated with the hand. The gauge must be able to indicate a gauge pressure (vacuum) of 34 kPa (10 inHg)]. See Table 2.
- Spark tester. The spark tester (ST125) is used to check the secondary ignition.
- Diagnostic Trouble Code tester. Rinda Technologies CodeMate Tester® (Hyster part number 3071579) or equivalent.

Table 2. Pressure Conversion Chart

Vacuum and pressure readings often cause confusion because everyone does not use the same point of reference. Absolute pressure is gauge pressure plus the atmospheric pressure. Standard atmospheric pressure is also called the standard barometric pressure and is equal to 101.325 kPa (14.695 psi) or [29.92 inches of mercury (Hg)] at sea level. The reference point for these measurements is zero pressure or an absolute vacuum. The conversion formula used in converting inches of mercury to kPa is:

Inches of Hg × 3.37685 = kPa

Service people normally use gauge pressure as the reference point which does not add the atmospheric pressure. The reference point for gauge pressure is atmospheric pressure. It is important to know when reading a pressure chart whether the units are given in absolute pressure or gauge pressure.

The gauges used by most service people indicate gauge pressure. However, most gauges calibrated in a metric scale (kilopascals) and used to measure less than atmospheric pressure normally indicate absolute pressure as shown in the chart. A gauge calibrated in inches of Hg and used to measure a vacuum begins at zero and increases its indication as the vacuum increases as shown in the gauge pressure column of the chart.

An additional cause of confusion is that the manifold pressure gauge for an engine with a turbocharger is normally calibrated for absolute pressure for both kilopascals and inches of Hg. The MAP sensor described in this section is also calibrated for absolute pressure, but the service person doing checking or troubleshooting will often be using gauges calibrated for gauge pressure.

Absolute Pressure		Gauge Pressure	
kPa	Inches of Hg	Inches of Hg	
121.57	36	6	Pressure ↑ - - - - - ↓ Vacuum
114.81	34	4	
108.06	32	2	
101.31	30	0	
94.55	28	2	
87.80	26	4	
81.04	24	6	
74.29	22	8	
67.54	20	10	
60.78	18	12	
54.03	16	14	
47.28	14	16	
40.52	12	18	
33.77	10	20	
27.01	8	22	
20.26	6	24	
13.51	4	26	

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