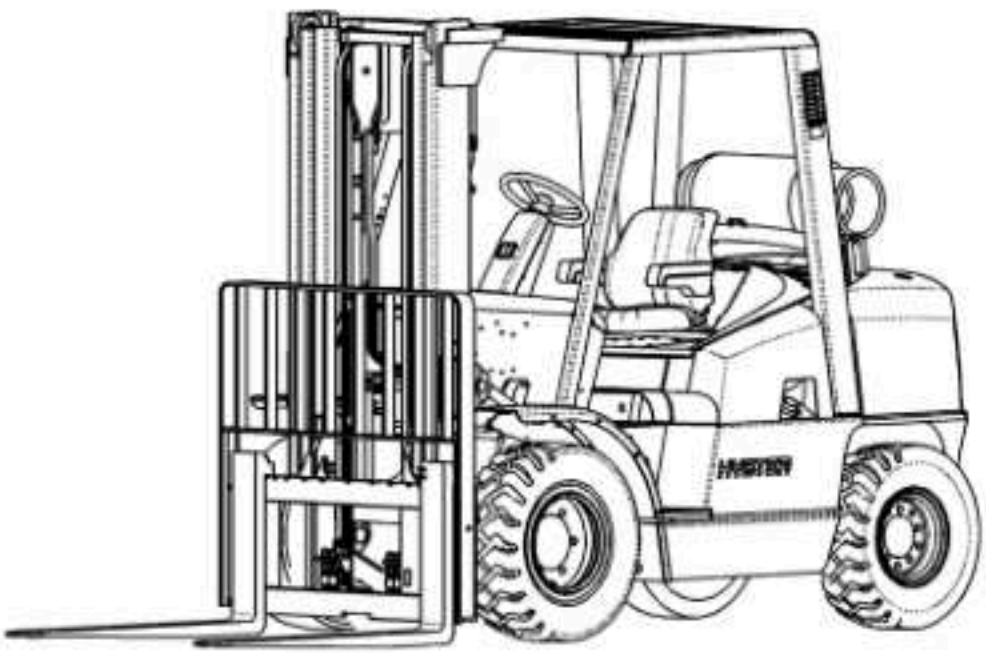
SERVICE MANUAL

S70-120XM (F004)



FORM 1559863 Rev. 03/04

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S70-120XM (F004)
SERVICE MANUAL CONTENTS

Section	SRM Number	Rev Date
FRAME	0100 SRM 0981	12/03
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
ELECTRONIC CONTROLLED LPG/GASOLINE FUEL SYSTEM GM 3.0L	0900 SRM 1088	03/04
& 4.3L EPA COMPLIANT ENGINES	0900 SRM 1088	03/04
SINGLE-SPEED PS TRANSMISSION-REPAIR	1300 SRM 0397	02/04
SINGLE-SPEED PS TRANS-DESCR / OPER	1300 SRM 0399	09/03
DRIVE AXLE	1400 SRM 0984	09/03
STEERING CONTROL UNIT	1600 SRM 0732	10/03
STEERING AXLE	1600 SRM 0326	10/03
BRAKE SYSTEM	1800 SRM 0985	09/03
HYDRAULIC GEAR PUMP	1900 SRM 0097	10/03
HYDRAULIC PUMP DRIVE ASSEMBLY	1900 SRM 0339	10/03
HYDRAULIC SYSTEM	1900 SRM 0743	10/03
MAIN CONTROL VALVE	2000 SRM 0754	12/03
TILT CYLINDERS	2100 SRM 0986	09/03
STARTER	2200 SRM 0755	10/03
INSTRUMENT PANEL INDICATORS and SENDERS	2200 SRM 0756	11/03
ALTERNATOR	2200 SRM 0002	10/03
ELECTRONIC CONTROL MODULE (ECM) DIAGNOSTIC	2200 SRM 1090	01/04
TROUBLESHOOTING GM 3.0L AND 4.3L EP COMPLIANT ENGINES	2200 SRM 1090	01/04
HIGH VOLTAGE SWITCH (HVS) IGNITION GM 4.3L EPA COMPLIANT	2200 SRM 1097	12/03
ENGINES	2200 SRM 1097	12/03
LIFT CYLINDERS	4000 SRM 0741	10/03
MAST	4000 SRM 0736	10/03
INCH (SAE) and METRIC FASTENERS	8000 SRM 0231	03/03
PERIODIC MAINTENANCE	8000 SRM 0987	12/03
CAPACITIES and SPECIFICATIONS	8000 SRM 0988	09/03
DIAGRAMS	8000 SRM 0989	12/03

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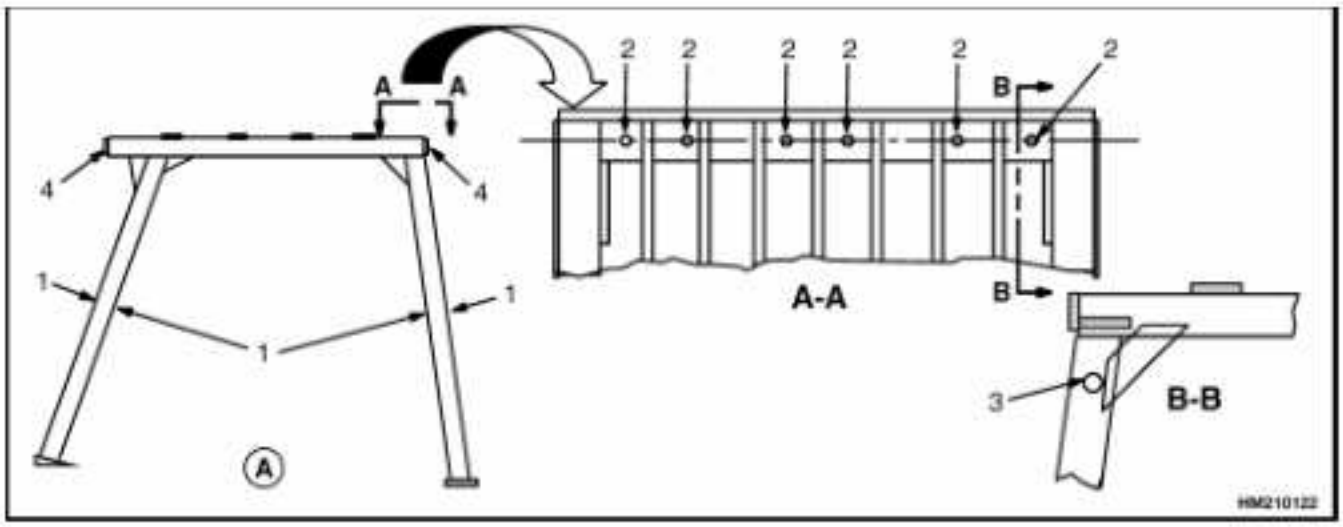
Overhead Guard Changes

WARNING

Do not weld mounts for lights or accessories to the overhead guard except to the front and rear cross bars shown in Figure 43. The strength of the overhead guard can be reduced by welding or heating.

Install lights and accessories or their mounts with clamps or nuts and bolts. Make sure mount holes are correct size and are in correct location. The strength of the overhead guard can be reduced if holes are in the wrong location or are larger than specifications shown in Figure 43.

1. **DO NOT** drill holes on front or rear surfaces of the legs of overhead guard. Drill holes only on centerline of inside or outside surface of the leg. Maximum hole diameter allowed is 13 mm (0.51 in.). Minimum dimension allowed between holes is 50 mm (2.00 in.).
2. See Figure 43, VIEW A-A. Drill holes only on centerline of 50 mm (2.00 in.) surface of 12 x 50 mm (0.50 x 2.00 in.) cross bars. Maximum hole diameter allowed is 10 mm (0.393 in.). Minimum dimension allowed between holes is 50 mm (2.00 in.).
3. See Figure 43, VIEW B-B. One 22.3 mm (0.88 in.) hole is permitted on centerline of inside surface of right rear leg in location shown for electric wires to lights or accessories.
4. Mounts for lights and accessories can be welded to front and rear cross bars.



A. SIDE VIEW OF OVERHEAD GUARD

1. FRONT AND REAR SURFACES OVERHEAD GUARD LEGS
2. CROSSBAR CENTERLINES
3. CENTERLINE INSIDE SURFACE RIGHT REAR LEG
4. MOUNTS FOR LIGHTS AND ACCESSORIES

Figure 43. Overhead Guard Changes

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Table 14. Rough, Unstable, Incorrect Idle, or Stalling (Continued)

Checks	Action
Additional Checks	**CAUTION** **The LPG Fuel system works on a fumigation principle of fuel introduction and is more sensitive to intake manifold leakage than the gasoline fuel supply system.** • Check for vacuum leaks. Vacuum leaks can cause a higher than normal idle and low throttle angle control command. • Check the ECM grounds for being clean, tight, and in their proper locations. • Check the battery cables and ground straps. They should be clean and secure. Erratic voltage may cause all sensor readings to be skewed resulting in poor idle quality.
Engine Mechanical Check	• Check the engine for the following: – Broken motor mounts – Improper valve timing – Low compression – Bent pushrods – Worn rocker arms – Broken or weak valve springs – Worn camshaft lobes

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Table 16. DTC 132 - MAP Low Voltage (Bosch® TMAP) (Continued)

Step	Action	Value(s)	Yes	No
8	• Probe MAP signal circuit with a test light connected to battery voltage 17. Does the laptop computer display MAP voltage of 4.0 or greater?		Go to step 9.	Go to step 13.
9	• Key **OFF**. • Disconnect the wire harness connector from the ECM. • Check for continuity between TMAP sensor connector and ECM 5 volt reference signal. Do you have continuity between them?		Go to step 10.	Repair the circuit as necessary. Refer to Wire Harness Repair. Go to step 18.
10	• Check for continuity between TMAP sensor connector 5 volt reference pin 3 signal and engine ground. Do you have continuity?		Repair the circuit as necessary. Refer to Wire Harness Repair. Go to step 17.	Go to step 11.
11	• Inspect ECM connector and wire harness connector terminals for corrosion, contamination or mechanical damage. Any problems found?		Repair the circuit as necessary. Refer to Wire Harness Repair. Go to step 18.	Go to step 16.
12	• Replace the ECM. Is the replacement complete?		Go to step 17	
13	• Disconnect the wire harness connector from the ECM. • Check for continuity between TMAP sensor connector signal circuit pin 4 and ECM signal pin 33. Do you have continuity between them?		Go to step 14.	Repair the circuit as necessary. Refer to Wire Harness Repair. Go to step 18.
14	• Check for continuity between TMAP sensor connector signal pin 4 and engine ground. Do you have continuity?		Repair the circuit as necessary. Refer to Wire Harness Repair. Go to step 18.	Go to step 15.

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