SERVICE MANUAL

H45-50-55-60-65XM (H177)



FORM 1456964 Rev. 03/04

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SERVICE MANUAL CONTENTS

Section	SRM Number	Rev Date
FRAME	0100 SRM 0505	11/03
MAZDA M4-2.0G, M4-2.2G ENGINE	0600 SRM 0496	02/01
PERKINS 704-26 (2.6L) ENGINE	0600 SRM 0706	12/03
GM ENGINE REPAIR GM 3.0 LITER ENGINE	0600 SRM 1020	11/03
COOLING SYSTEM	0700 SRM 0626	11/01
LPG FUEL SYSTEM-GM (except AISAN)	0900 SRM 0498	01/96
GASOLINE FUEL SYSTEM (MAZDA)	0900 SRM 0502	01/01
LPG FUEL SYSTEM-MAZDA (except AISAN)	0900 SRM 0523	01/96
LPG FUEL SYSTEM (AISAN OPEN LOOP SYSTEM)	0900 SRM 0925	08/02
LPG FUEL SYSTEM (AISAN CLOSED LOOP SYSTEM	0900 SRM 0948	02/04
ELECTRONIC CONTROLLED LPG/GASOLINE FUEL SYSTEM GM 3.0L	0900 SRM 1088	03/04
& 4.3L EPA COMPLIANT ENGINES	0900 SRM 1088	03/04
POWERSHIFT TRANSMISSION-DESCR & OPER	1300 SRM 0500	08/03
POWERSHIFT TRANSMISSION-REPAIR	1300 SRM 0501	08/03
DRIVE AXLE	1400 SRM 0499	01/96
STEERING AXLE	1600 SRM 0316	03/03
STEERING HOUSING and CONTROL UNIT	1600 SRM 0720	11/03
BRAKE SYSTEM	1800 SRM 0506	12/03
HYDRAULIC SYSTEM and GEAR PUMP	1900 SRM 0513	12/95
MAIN CONTROL VALVE	2000 SRM 0516	11/95
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 CLUSTER	2200 SRM 0514	01/04
ELECTRICAL SYSTEM (MAZDA)	2200 SRM 0524	02/01
MSTS-GM 3.0L (EARLY CONTROL MODULES)	2200 SRM 0603	01/96
GM 3.0L ENGINE CONTROL-REPAIR (EARLY MODULES)	2200 SRM 0611	02/96
GM 3.0L ENG CONTROL-DESC/OPER (EARLY MODULES)	2200 SRM 0612	01/96
MSTS-GM 3.0L (LATER CONTROL MODULES)	2200 SRM 0765	11/01
GM 3.0L ENG CONTROL-DESC/OPER (LATER MODULES)	2200 SRM 0781	01/00
GM 3.0L ENGINE CONTROL-REPAIR (LATER MODULES)	2200 SRM 0782	03/00
EEC-DESC & OPER MEFI-4	2200 SRM 1016	07/02
EEC-TRBLSHT & REPAIR MEFI-4	2200 SRM 1017	07/02
ELECTRONIC CONTROL MODULE (ECM) DIAGNOSTIC	2200 SRM 1090	01/04
TROUBLESHOOTING GM 3.0L & 4.3L EPA COMPLIANT ENGINES	2200 SRM 1090	01/04

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MAST-DESCRIPTION	4000 SRM 0521	11/03
MAST-REPAIR	4000 SRM 0522	11/03
METRIC AND INCH (SAE) FASTENERS	8000 SRM 0231	03/03
PERIODIC MAINTENANCE	8000 SRM 0707	12/03
CAPACITIES and SPECIFICATIONS	8000 SRM 0708	01/03
DIAGRAMS	8000 SRM 0709	12/03

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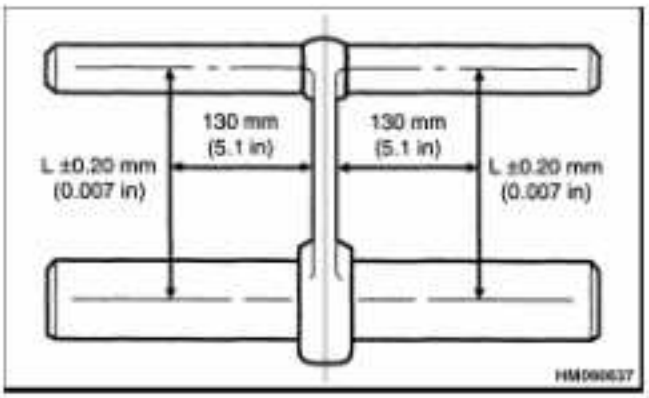
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Table 11. Piston Rings

Top compression ring	Barrel face, chromium
Second compression ring	Taper face, cast iron
Oil ring	Coil spring loaded, chromium face
Width of top ring	1.97 to 1.99 mm (0.0776 to 0.0783 in.)
Width of second ring	1.97 to 1.99 mm (0.0776 to 0.0783 in.)
Width of third ring	3.97 to 3.99 mm (0.156 to 0.157 in.)
Clearance of top ring in groove	0.003 to 0.005 mm (0.0001 to 0.0002 in.)
Clearance of second ring in groove	0.07 to 0.11 mm (0.003 to 0.004 in.)
Clearance of third ring in groove	0.05 to 0.09 mm (0.002 to 0.004 in.)
Gap of top ring	0.20 to 0.48 mm (0.008 to 0.019 in.)
Gap of second ring	0.30 to 0.63 mm (0.012 to 0.025 in.)
Gap of third ring	0.20 to 0.48 mm (0.008 to 0.019 in.)

Table 12. Connecting Rods

Type	"H" Section
Diameter, parent bore at big end	50.000 to 56.015 mm (1.9685 to 2.2053 in.)
Diameter, parent bore at small end	32.930 to 32.955 mm (1.2965 to 1.2974 in.)
Length between centers	159.975 to 160.025 mm (6.2982 to 6.3002 in.)



NOTE: THE LARGE AND SMALL BORES IN THE CONNECTING ROD MUST BE SQUARE AND PARALLEL WITH EACH OTHER WITHIN THE LIMITS OF ±0.20 mm (0.007 in.). THE MEASUREMENT IS MADE AT 130 mm (5.1 in.) ON EACH SIDE OF THE AXIS OF THE CONNECTING ROD.

Figure 130. Connecting Rod Alignment Check

Table 13. Piston Pins

Type	Full floating
Outside diameter	29.995 to 30.000 mm (1.1809 to 1.1811 in.)
Clearance fit in piston	0.003 to 0.014 mm (0.0001 to 0.0006 in.)

Table 14. Connecting Rod Bearings

Type	Steel back, aluminum to tin bearing material
Width	22.87 to 23.13 mm (0.900 to 0.911 in.)
Thickness	1.500 to 1.506 mm (0.0591 to 0.0593 in.)
Bearing clearance	0.018 to 0.064 mm (0.0007 to 0.0025 in.)
Available undersize bearings	−0.25 mm (−0.010 in.)
	−0.51 mm (−0.020 in.)
	−0.76 mm (−0.030 in.)

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ELECTRICAL WIRE CODES

WIRE	COLOR	GAUGE	WIRE	COLOR	GAUGE
A	DARK BLUE	18	BQ	DARK BLUE	10
C	WHITE	16	BR	RED	10
D	BROWN	16	BT	RED	10
G	ORANGE	16	BX	WHITE	12
L	BROWN	14	BY	BLACK	16
Q	ORANGE/BLK	18	BZ	RED	12
AB	YELLOW	14	CK	RED	16
BC	RED	10	CL	TAN	18
BE	DARK GREEN	18	CN	BLACK	16
BF	RED	10	CR	TAN	16
BM	BROWN/WHITE	14	CS	BLACK	16
BN	BROWN	14			

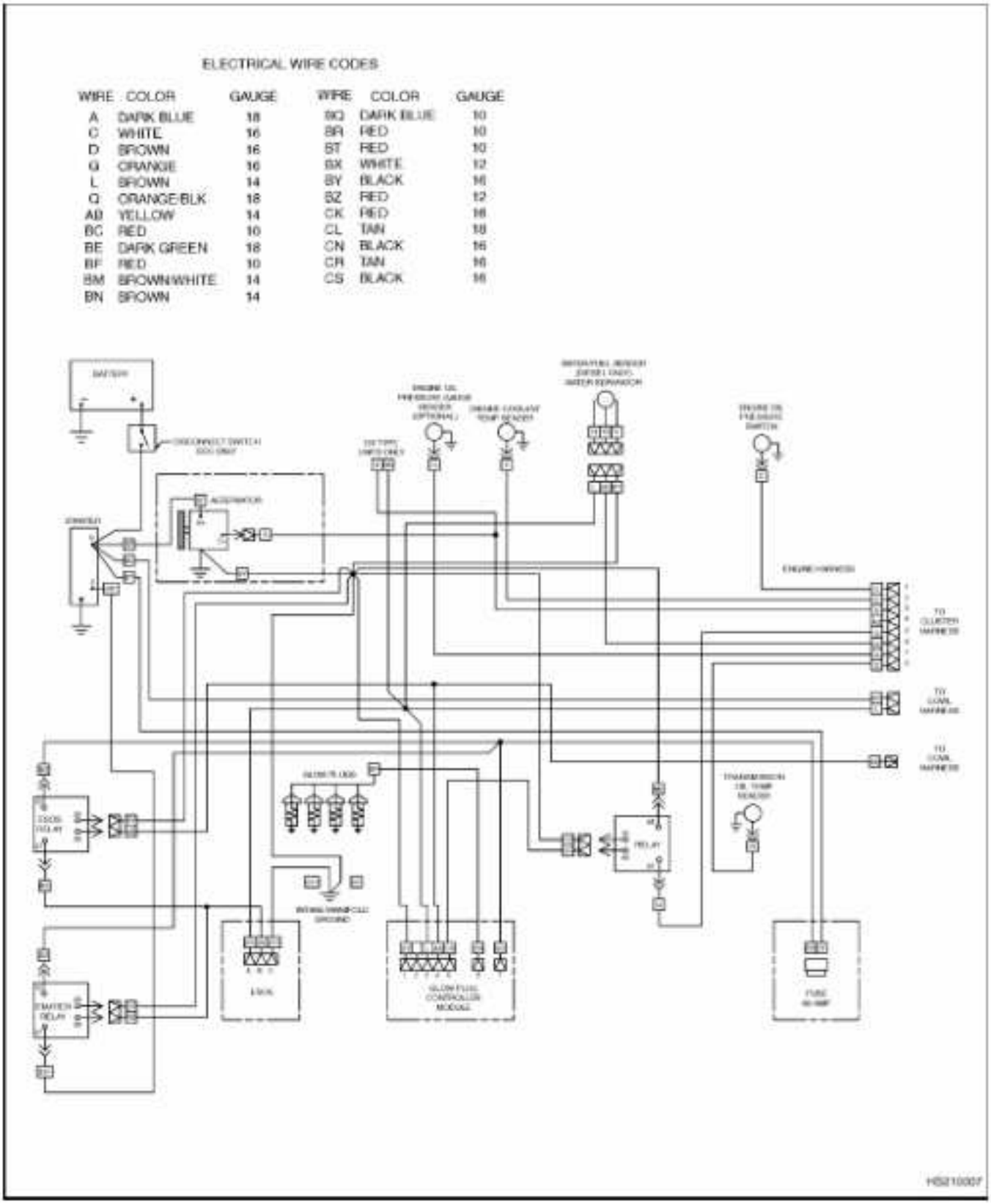


Figure 12. Perkins 2.6L Diesel Engine Wiring Schematic (Late Models)

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Table 14. Ignition System Troubleshooting (Continued)

Step	Action	Value	Yes	No
9	1. Disconnect the four-terminal ignition module connector located on the distributor. 2. Remove the distributor cap and disconnect the sensing coil from the ignition module, which is located under the timer core. 3. Connect a voltmeter from the TACH Connector to ground. 4. Turn ignition switch to **ON**, leaving the engine **OFF**. 5. Insulate the probe on the test light to 6 mm (0.24 in.) from the tip. 6. Connect the uninsulated probe of the test light to a 1.5- to 8-volt DC power supply. 7. Check the voltmeter when the insulated probe of the test light is touched to terminal **P** of the ignition module. Is there a voltage decrease?		Go to Step 10.	Go to Step 21.
10	Using a spark tester, check for spark from the coil wire when the test light is removed from terminal **P**. Is there spark?		Go to Step 11.	Go to Step 12.
11	Check the rotating timer core to see if it is magnetized. Is the rotating timer core magnetized?		Go to Step 22.	Go to Step 23.
12	Replace the ignition coil and repeat Step 10. Is there spark?		System is correct.	Go to Step 24.
13	Check for fuel supply to engine. Check spark plugs. Check for other faults not in the ignition system. Is action complete?		Verify repair.	
14	Replace sensing coil. Is action complete?		Verify repair.	
15	Inspect the distributor cap for water, cracks, or other damage. If the distributor cap is in good condition, replace the distributor rotor. Is action complete?		Verify repair.	
16	Repair the pink wire from the ignition module + terminal to the + terminal on the ignition coil. Is action complete?		Verify repair.	

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