MX Magnum - Service Manual
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Mechanical 8.3L Engine for MX210 and MX230 Manual Number 7-65440

Section

1000

Standard Torque Specification

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

Rac 7-68611

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November, 2002

TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphites, Molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
Size	Pound-Feet	Newton metres
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inch	800 to 880	1085 to 1193
1-1/4 inch	1120 to 1240	1519 to 1681
1-3/8 inch	1460 to 1680	1980 to 2278
1-1/2 inch	1940 to 2200	2631 to 2983

Grade 8 Bolts, Nuts, and Studs

Size	Pound-Inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
Size	Pound-Feet	Newton metres
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inch	1280 to 1440	1736 to 1953
1-1/4 inch	1820 to 2000	2468 to 2712
1-3/8 inch	2380 to 2720	3227 to 3688
1-1/2 inch	3160 to 3560	4285 to 4827

NOTE: *Use thick nuts with Grade 8 bolts.*

TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

Grade 8.8 Bolts, Nuts, and Studs

8.8

Size	Pound-Inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
Size	Pound-Feet	Newton metres
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

Grade 10.9 Bolts, Nuts, and Studs

10.9

Size	Pound-Inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
Size	Pound-Feet	Newton metres
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

Grade 12.9 Bolts, Nuts, and Studs

12.9

Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
37 Degree Flare Fitting			
1/4 inch 6.4 mm	7/16-20	72 to 144	8 to 16
5/16 inch 7.9 mm	1/2-20	96 to 192	11 to 22
3/8 inch 9.5 mm	9/16-18	120 to 300	14 to 34
1/2 inch 12.7 mm	3/4-16	180 to 504	20 to 57
5/8 inch 15.9 mm	7/8-14	300 to 696	34 to 79
Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres
3/4 inch 19.0 mm	1-1/16-12	40 to 80	54 to 108
7/8 inch 22.2 mm	1-3/16-12	60 to 100	81 to 135
1.0 inch 25.4 mm	1-5/16-12	75 to 117	102 to 158
1-1/4 inch 31.8 mm	1-5/8-12	125 to 165	169 to 223
1-1/2 inch 38.1 mm	1-7/8-12	210 to 250	285 to 338

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
Straight Threads with O-ring			
1/4 inch 6.4 mm	7/16-20	144 to 228	16 to 26
5/16 inch 7.9 mm	1/2-20	192 to 300	22 to 34
3/8 inch 9.5 mm	9/16-18	300 to 480	34 to 54
1/2 inch 12.7 mm	3/4-16	540 to 804	57 to 91
Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres
5/8 inch 15.9 mm	7/8-14	58 to 92	79 to 124
3/4 inch 19.0 mm	1-1/16-12	80 to 128	108 to 174
7/8 inch 22.2 mm	1-3/16-12	100 to 160	136 to 216
1.0 inch 25.4 mm	1-5/16-12	117 to 187	159 to 253
1-1/4 inch 31.8 mm	1-5/8-12	165 to 264	224 to 357
1-1/2 inch 38.1 mm	1-7/8-12	250 to 400	339 to 542

Split Flange Mounting Bolts		
Size	Pound-Inches	Newton metres
5/16-18	180 to 240	20 to 27
3/8-16	240 to 300	27 to 34
7/16-14	420 to 540	47 to 61
Size	Pound-Feet	Newton metres
1/2-13	55 to 65	74 to 88
5/8-11	140 to 150	190 to 203

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	Thread Size	Pound-Inches	Newton metres
O-ring Face Seal End					**O-ring Boss End Fitting or Lock Nut**		
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
					Thread Size	Pound-Feet	Newton metres
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Feet	Newton metres	1-1/16-12	85 to 90	115 to 122
					1-3/16-12	95 to 100	129 to 136
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-5/16-12	115 to 125	156 to 169
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-5/8-12	150 to 160	203 to 217
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-7/8-12	190 to 200	258 to 271
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190			
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254			

Section

1001

SAFETY, GENERAL INFORMATION / MAINTENANCE SCHEDULE

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

Rac 6-13960

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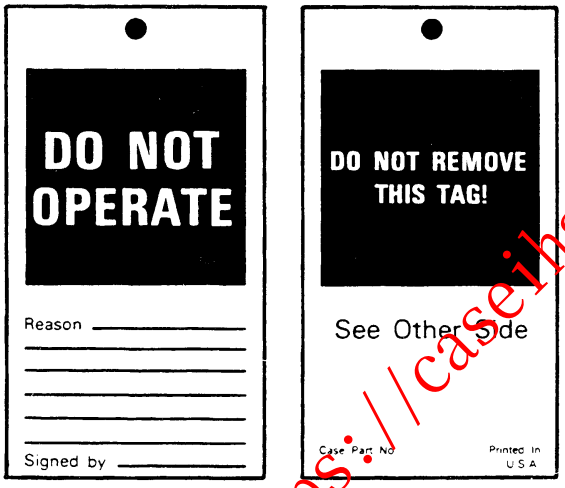
SAFETY

THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH. M171B

To prevent injury always follow the Warning, Caution and Danger notes in this section and throughout the manual.

Put the warning tag shown below on the key for the key switch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags are available from your service parts supplier.

Before servicing a machine, park the machine on hard level ground. Turn off the engine, apply the parking brake and remove the key from the key switch. Put blocks in front of and behind either the front or rear wheels.



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WARNING: *Read the operators manual to familiarize yourself with the correct control functions.* M489

WARNING: *Operate the machine and equipment controls from the seat position only. Any other method could result in serious injury.* M490

WARNING: *This is one man machine, no riders allowed.* M491

WARNING: *Before starting engine study Operators Manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating. It is your responsibility to understand and follow manufacturers instructions on machine operation, service, and to observe pertinent laws and regulations. Operator and Service Manuals may be obtained from your equipment dealer.* M103A

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* M492

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.* M493

WARNING: *When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.* M494

WARNING: *When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.* M495

WARNING: *Always wear heat protective gloves to prevent burning your hands when handling heated parts.* SM121A

WARNING: *Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service.* M496

WARNING: *Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury.*
To Prevent Personal Injury:
Relieve all pressure, before disconnecting fluid lines. Before applying pressure, make sure all connections are tight and components are in good condition.
Never use your hand to check for suspected leaks under pressure.
Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately. SM171A

WARNING: *When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.* M497

WARNING: *When using a hammer to remove and install pivot pins or separate parts using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).* M498

WARNING: *Use suitable floor (service) jacks or chain hoist to raise wheels or tracks off the floor. Always block machine in placed with suitable safety stands.* M499

WARNING: *When servicing or repairing the machine. Keep the shop floor and operators compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and or shop cloths as required. Use safe practices at all times.* M500

WARNING: *Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in the Service Manual.* M501

WARNING: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the door and get outside air into the area.* M502

WARNING: *When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.* M503

WARNING: *Batteries contain acid and explosive gas. Explosions can result from sparks, flames or wrong cable connections. To connect the jumper cables correctly to the battery of this machine see the Operators Manual. Failure to follow these instructions can cause serious injury or death.* M504

GENERAL INFORMATION

Cleaning

Clean all metal parts except bearings, in mineral spirits or by steam cleaning. Do not use caustic soda for steam cleaning. After cleaning, dry and put oil on all parts. Clean oil passages with compressed air.

Inspection

Check all parts when the parts are disassembled. Replace all parts that have excessive wear or are damaged. Small scoring or grooves can be removed with a hone or crocus cloth. Complete visual inspection for indications of wear, pitting and the replacement of parts necessary will prevent early failures.

Bearings

Clean bearings with a good clean solvent and permit to air dry. **DO NOT DRY BEARINGS WITH COMPRESSED AIR.** Check bearings for smooth easy action. If the bearing has a loose fit or rough action, the bearing must be replaced.

Needle Bearings

Before you press needle bearings into a bore, always remove any metal protrusions in the bore or the edge of the bore. Before you press bearings into position, put petroleum jelly on the inside and outside diameter of the bearing.

Gears

Check all gears for excessive wear or damage. Replace gears as necessary.

Oil Seals, O-rings and Gaskets

Always install new oil seals, O-rings and gaskets. Put petroleum jelly on seals and O-rings.

Shafts

Check all shafts for excessive wear or damage. Check the bearing and oil seal surfaces on the shafts for excessive wear or damage. Replace shafts as necessary.

Service Parts

Always install genuine Case service parts. When ordering refer to the Parts Catalog for the correct part number of the genuine Case replacement items. Failures due to the use of other than genuine Case replacement parts are not covered by warranty.

Lubrication

Use only the oils and lubrication specified in the Operators or Service Manual. Failures due to the use of non specified oils and lubricants are not covered by warranty.

MAINTENANCE SCHEDULE

Service Interval	Maintenance Requirement	Check	Grease	Change	Clean
When Warning Message Displays	Air Cleaner Element				X
Every 10 Hours Or Daily	Engine Oil Level	X			
	Engine Coolant Level	X			
	Transmission Oil Level	X			
Every 50 Hours	Engine Primary Fuel Filter - Drain Water				
Every 100 Hours	Front Hitch (If Equipped)		X		
Every 300 Hours	Battery Water Level	X			
	Engine Air Intake Hoses	X			
	Engine Coolant Level-Deaeration Tank	X			
	*Engine Oil And Filter			X	
	Front And Rear Wheel Bolt Torques	X			
	Front Axle And Rear Hitch (Note A)		X		
	Fuel Tank - Drain Water				
	Differential And Planetary Oil Level (Note B)	X			
Every 600 Hours	Engine Coolant Antifreeze Protection	X			
	Engine Coolant Filter			X	
	Engine Coolant Hoses And Clamps	X			
	Engine Fuel Filters			X	
	Changeable PTO Internal Splines		X		
Every 1200 Hours Or Annually	Engine Primary And Secondary Air Filter			X	
	Engine Air Precleaner				X
	Differential and Planetary Oil			X	
Every 1200 Hours	Engine Valve Adjustment (Model 210 & 230) (Note C)	X			
Every 1500 Hours	Transmission Oil, Filter(s) and Breather			X	
Every 2400 Hours	Engine Coolant And Coolant Conditioner			X	
	Engine Fuel Injection Nozzles and Pump See (Note C)	X			
	Engine Crankshaft Dampener (Note C)	X			
As Required	Cab Air And Recirculation Filters			X	X
	Cab Air Filter Dust Valve	X			
	Engine Primary Air Filter				X
	Grill Screens, Radiator, Condenser/Fuel Cooler, Oil Cooler, Air to Air Cooler				X
	Serpentine Belt			X	
	Tire Pressure	X			

Note A -In severe or wet conditions, Interval is every 10 hours or daily.
Note B - Perform initial service in first 50 hours of operation.

Note C - Dealer must perform this service.

NOTE 1: *Check the tractor for leaks, rubbing hoses, loose bolts and trash build up. Repair all leaks, hoses and tighten loose bolts before operation.*

NOTE 2: *Check for wear and function.*

NOTE 3: *In dusty conditions the cab filter will require more frequent cleaning.(Renew as necessary).*

NOTE 4: *Also clean the filter element whenever the service monitor illuminates.*

NOTE 5: *Change at first 50 hours.*

NOTE 6: *In severe operating conditions grease daily.*

NOTE 7: *After any wheel adjustment, check after 30 minutes then every 10 hours until torques stabilize.*

NOTE 8: *Recommend Dealer Service Item.*

Section

1002

GENERAL SPECIFICATIONS AND SPECIAL TORQUES

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

Rac 6-13870

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GENERAL SPECIFICATIONS

Fluid Capacities and Types

All fluid capacities listed are a guide to the quantities required. Always use dipsticks, sight glasses or level plugs to ensure that the units are filled to the correct level.

Coolant Capacity		
MX 210 and 230	22.7 liters	6 U.S. gal
MX 255 and 285	24.6 liters	6.5 U.S. gal
Fluid Type	50 Percent Ethylene Glycol and Water	
Engine Oil Capacity		
With Filter Change	21 liters	5.5 U.S. Gal
Without Filter Change	19 liters	5 U.S. Gal
Oil Type	Case No. 1 Multi-Viscosity Engine Oil	
Transmission/Hydraulic System Capacity		
2WD and MFD	172 liters	45.5 U.S. gal
Oil Type	Case Hy-Tran®Ultra	
MFD Axle		
Differential		
10 Bolt	12.3 liters	13 quarts
12 Bolt	11.3 liters	12.3 quarts
Oil Type	Case 135 H EP Gear Lubricant, SAE 85W-140 with Limited Slip Additive B91246	
Planetary (Each)		
10 Bolt	1.3 liters	2.8 U.S. pints
12 Bolt	3.2 liters	6.8 U.S. pints
Oil Type	Case 135 H EP Gear Lubricant, SAE 85W-140	
Fuel Tank		
Standard - MX 210 and 230	492 liters	130 U.S. gal
Standard - MX 255 and 285 (Optional - MX 210 and 230)	606 liters	160 U.S. gal
Fuel Type	No. 2 Diesel	

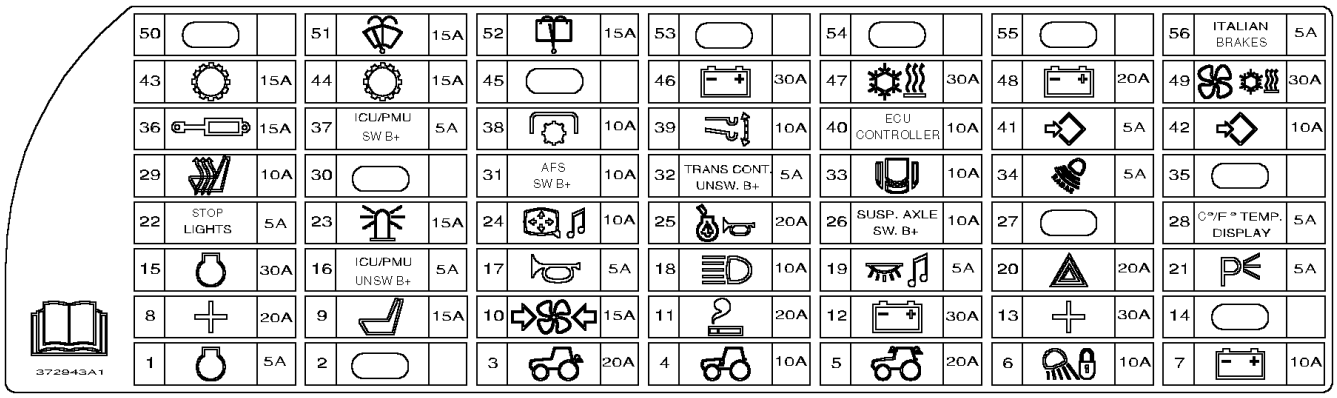
Hydraulic Specifications

Pump Type	Axial Piston, Pressure and Flow Compensated	
Maximum Pressure at Rated Engine RPM at Pump	224 bar	3250 psi
Maximum Flow at Remote Couplers at 2000 Engine RPM		
Standard	136 l/min	36 gpm
Optional	244 l/min	64 gpm

Electrical Specifications

Type of System	12 Volt Negative Ground
Batteries	Two 1000 CCA Low Maintenance, Group Size 31
Alternator	Bosch 135 Amp Output
Cranking Motor	Nipendenzo, 12 Volt, 4 kw

Cab Fuse Identification and Amperage



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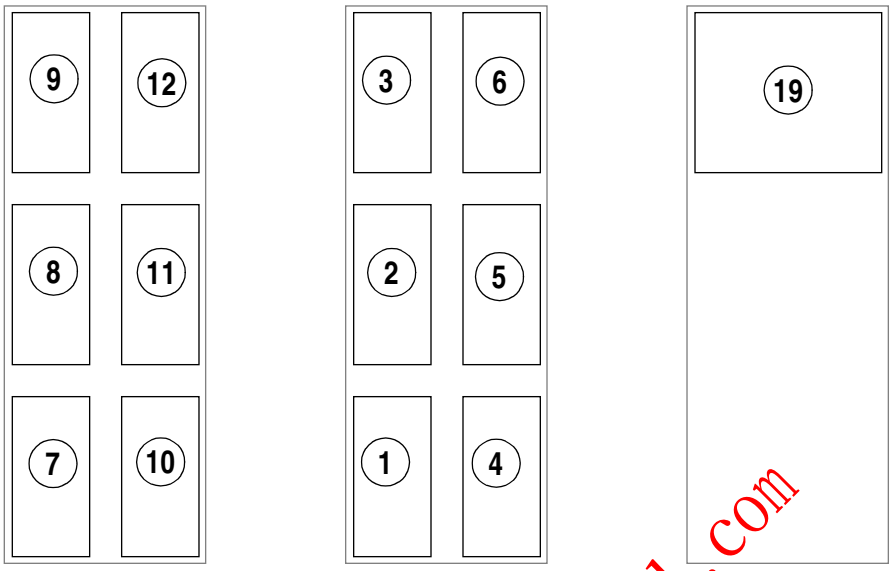
Fuse No.	Circuit	Fuse Amp
1	Electronic Governor (MX255 & MX285)	5
2	Cruise Control	5
3	Rear Fender Worklights	20
4	Beltline Worklights	10
5	Roof Worklights	20
6	Worklight/Headlight Interlock	10
7	Battery Power to Key Switch	5
8	Headliner Shelf Auxiliary Power/3-Pin/ Cigar Outlets (Unswitched)	20
9	Seat Power	15
10	Cab Pressurizer Blower (Continuous)	15
11	Cigar Lighter/RH Fender Console (Unswitched)	20
12	Exterior 7-Pin Connector (Switched)	30
13	RH Front Post/RH Fender 3-Pin Auxiliary Connectors (Unswitched)	30
15	Governor (MX255 & MX285)	30
16	Tractor Instrumentation (Unswitched)	5
18	High Beam Relay	10
19	Dome Light/Map Light/Radio (Unswitched)	5
20	Amber Flashers	20
21	Tail Lights	5
22	StopLights	5
23	Strobe Light/Becon	15

Fuse No.	Circuit	Fuse Amp
24	Mirror/Radio	10
25	Ether/Horn	20
28	Auto Climate Display (With Fuse = °C, Without Fuse = °F)	5
29	Seat Heater	10
31	AFS (Switched)	10
32	AFS (Unswitched)	10
33	RH ArmRest Controller (Switched)	10
34	True Ground Radar	5
35	Transmission Controller	20
36	Remote Hydraulic Controller	15
37	Tractor Instrumentation (Switched)	
38	PTO/Differential Lock/MFD Controller	10
39	Hitch Controller	10
41	Case Data Bus, Tractor	5
42	Case Data Bus Diagnostic Connector	10
46	RH Front Post/RH Fender 3-Pin Connectors (Switched)	30
47	HVAC Controller	30
48	Headliner Shelf 3-Pin Connectors (Switched)	20
49	HVAC Blower	30
51*	Front Wiper/Washer	15
52	Rear Wiper/Washer	15
56	Italian Brakes	5

(Unswitched) - Unswitched power (Continuous).
(Switched) - Power available when keyswitch is in “ON” position.
* = Circuit breaker.

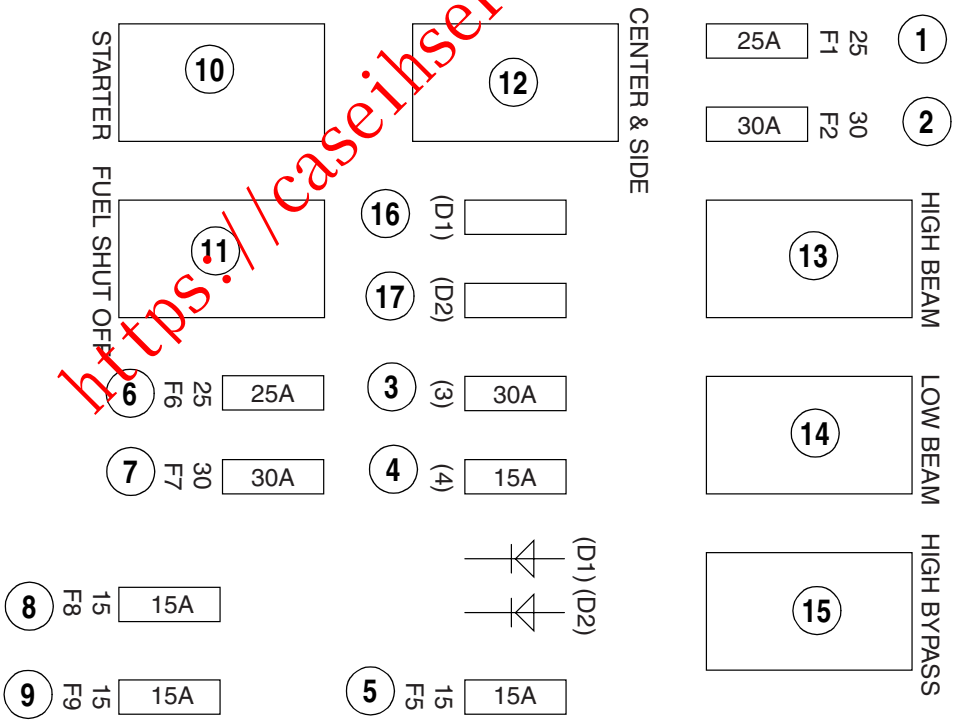
Cab Relay Identification (Facing Rear Window)



RH02G061

1. BRAKE LAMPS
2. OPEN
3. REAR ROOF WORK LAMPS
4. WORK LAMP INTERLOCK
5. PARK LATCH
6. NEUTRAL RELAY
7. OPEN
8. BELTLINE WORK LAMPS
9. FRONT ROOF WORK LAMPS
10. CAB PRESSURIZER BLOWER
11. GOVERNOR (KEY SWITCH)
12. FENDER WORK LAMPS
19. CONTROLLER POWER

Engine Compartment Fuse/Relay Identification (Power Distribution Box)



RH02G062

1. CENTERED & SIDE WORKLAMP RELAY FUSE
2. HIGH/LOW BEAM & BYPASS RELAYS FUSE
3. STARTER RELAY FUSE
4. RH HI BEAM FUSE
5. LH HI BEAM RELAY FUSE
6. FUEL SHUT OFF RELAY FUSE
7. STARTER RELAY FUSE
8. RH LO BEAM RELAY FUSE
9. LH LO BEAM RELAY FUSE
10. STARTER RELAY
11. FUEL SHUT OFF RELAY
12. CENTERED AND SIDE WORKLAMP RELAY
13. HIGH BEAM RELAY
14. LOW BEAM RELAY
15. HIGH BYPASS RELAY
16. NOT USED - DIODE 1
17. NOT USED - DIODE 2

Lamps and Bulbs

Application	G.E. Bulb No. (Watts)
Dome Lamp Bulb	Case Part No. 3050958R1, (10W)
Console Lamp Bulb	No. 168
Flasher Lamp Bulb	No. 1156
Head Lamps	No. H4, (55W/60W Halogen)
Brake Lamps	3157 (37W)
Side Work Lamps	No. 885, (50W)
Front and Rear Flood Lamps, Optional Fender/Rear Roof/Beltline Flood Lamps	No. H3, (55W)
Tail Lamp Bulbs	No. 3157, (37W)
Fender Standard Work Lamp	No. 894, (37W)
Front Roof Work Lamp	No. 894, (37W)
Center Grille Work Lamp	No. 885, (50W)
HID Center Work Lamp	Case Part N. 232455A2, (35W)
Strobe Light	No. 400, (80W)
Number Plate Lamp	Case Part No. P40556

Accessory Connectors

7 Terminal Electrical Outlet	Equipped for Directional Lamps, Tail lamps and 12 Volt Power for Implements with Fuse Protection
3 Pin Cab Connector (2 Standard) (2 Optional)	12 volt Power with/or with/out Key Switch and Direct Ground for Implement Controllers and Monitors

WARNING: *Do not look directly into the High Intensity Discharge Lamp. Eye damage can occur.* M638

WARNING: *Do not tamper with the ballast on the High Intensity Discharge Lamp as it contains high voltage. Personal injury or death can occur.* M639