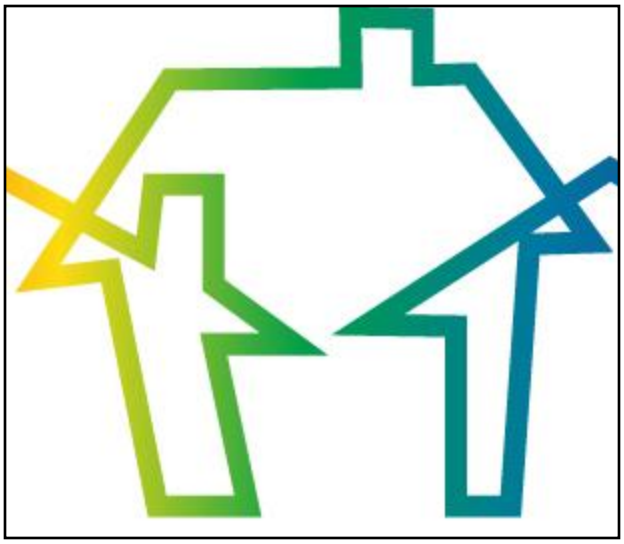
INSPECTION REPORT



For the Property at:

321 TYPICAL STREET

TORONTO, ON

Prepared for: VALUED CLIENT

Inspection Date: Tuesday, October 2, 2012

Prepared by: Lisa Simkins

METICULOUS INSPECTIONS

Meticulous Inspections Inc.
11 Wilkins Ave
Toronto, ON M5A 3C2
647-287-1962
www.meticulousinspections.ca
info@meticulousinspections.ca

Use this home inspection to increase the safety, comfort and value of your home.

Note: For the purpose of this report the building is considered to be facing **North**.

OUR PHILOSOPHY

The inspection is aimed at finding functional items that could be improved to increase the safety, comfort and value of your home.

SCOPE

A home inspection is a survey of the major systems of the house including roofing, exterior, structural, interior, structure, electrical, plumbing, heating, cooling, insulation and ventilation. In the short period of inspection time, as much information is gathered as practical to report on conditions. The findings are a snapshot of the visible conditions of the installed systems at the time of inspection.

EXPERT ADVICE

Generally, I also encourage home owners to have specialists and qualified contractors inspect various systems of the house, for an expert opinion, especially on older or dysfunctional systems. Several Ontario regulatory safety associations will provide inspection services and lists of licensed/certified contractors. These include:

- Technical Standards and Safety Authority (TSSA), will inspect gas and oil burning supply systems, such as those that service furnaces, hot water heaters and fireplaces. www.tssa.org 1-877-682-8772

- Electrical Safety Authority (ESA), will inspect electrical systems. www.esasafe.com 1-877-372-7233

There are some important things you should do when taking possession of a home. These are detailed in the Priority Maintenance document, which you can access by clicking on the link below.

Maintenance schedule for your home

DESCRIPTION OF REPORT

The report that follows includes a description of the systems and components in the house as well as any Limitations that may have restricted the inspection. General limitations are spelled out in the Home Inspection Contract.

The most important part of the report are the Recommendations in each section. It is here that defects are identified and improvements may be suggested. NOTE: there are many clickable links throughout the report where you can access more information about house systems or deficiencies. You can also move quickly between the various house systems in the report by clicking on the coloured tabs at the top of each page.

As you read the report, we encourage you to contact me with any questions about the report or the home.

HIGHLIGHTS

This section provides a snapshot of potentially significant issues from a cost or safety standpoint. More detailed findings are listed in the body of the report. Please read the entire report; it will assist you to plan and budget for repairs. For instance, if a major and minor item are listed in a section, it will likely be cost effective for you to have a contractor visit to address both at the same time, to reduce service calls.

SITE

We were advised that the semi-detached house is approximately 90 years old.

ROOF

The front north facing roofing is old and at the end of it's lifespan. The main front north facing peaked portion, front porch and bay window roofing should be stripped and replaced. Flashing should be replaced or repaired at that time. The rear flat roof needs some sealing at the edges. The rear facing shingles appear to be intact. Note that severe weather events or damage can cause roof leaks at any time.

EXTERIOR

The house should have improved sealing in siding and walls around windows, doors and joints to reduce chances of water infiltration as described in the report. Tuckpointing repairs and gutter cleaning are also recommended to help protect against water. Some windows and doors need fixing of screens and operation. The basement stairwell needs a handrail, and porch rail requires fixing. The deck support appears insufficient and should be improved, as well the deck floor boards are old and showing signs of rot. The downspout and basement stairwell drainage system should be evaluated for improvement for protecting the basement from water infiltration.

STRUCTURE

The house has a brick foundation with timber frame, aluminum cladding and brick veneer front. Improvement of the firewall in the attic is recommended. Other minor repairs and monitoring are suggested to help protect the structure.

ELECTRICAL

Due to the age of the house and modifications done over time, the electrical panel and distribution system should be thoroughly inspected by a licensed electrician. For example, there is some questionable wiring within the distribution panel, and a burned electrical receptacle. Cover plates should be installed on any open receptacles or boxes. The number of receptacles is typical for the age of the house, however modern practices require more circuits for receptacles and lights. Some issues found are detailed within the body of this report.

HEATING

The gas fired boiler is 10 years old with a typical life expectancy of 25-50 years. There is some rust at the burners and pipes, and the boiler, pipes and radiators should be checked at the start of each heating season by a qualified plumbing and heating technician. The water distribution pipes are wrapped in material which is ripped and possibly contains asbestos. This damaged material may have released asbestos and should either be encapsulated or removed. Consult an asbestos removal specialist for advice and estimates. Note if the asbestos material is left in place, it may affect the resale value of the house, although encapsulation will provide protection from exposure. Removal is more economical if renovations are to be done as well. See the information brochure in the appendix of the report.

COOLING

The ductless air conditioning system is about 7 years old. Annual inspection and servicing by an HVAC technician at the start of the cooling season is recommended. Product information and manuals are included in the appendix.

INSULATION

The attic is insulated with blown cellulose, to approximately R-28. Wall insulation could not be determined, but based on the known history of the house and visual clues, may be missing. Blown cellulose could be added into the walls if desired.

PLUMBING

The main supply pipe appears to be galvanized, and may be causing low flow in the house. Recommend replacement with copper supply pipe from the city piping to the meter. Several minor repairs of piping and fixtures are recommended.

INTERIOR

The 24 year old windows are functional but need some repairs. The rear doors of the house are in poor condition and the main floor kitchen counter is water damaged around the sink. The basement bathroom fan requires an exterior vent termination. Other items are noted in the report.

REPAIRS

There are published sources for repair and renovation estimates. One of these is www.Ontariocontractors.com.

See also:

Home Improvement - ballpark costs

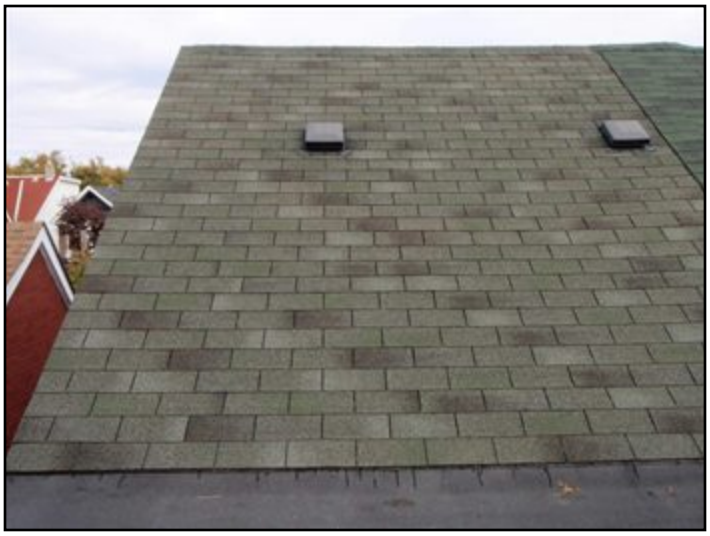
Description

Sloped roofing material:

• Asphalt shingles

Shingles on peaked roof, over porch and bay window.

According to current owner, the rear shingles were replaced in 2002.



Rear of peaked roof

Roof peak

Front of peaked roof

• Wood shingles/shakes

visible under front asphalt shingles

Layers of roofing over front porch

• Strip when reroofing

Flat roofing material:

• Roll roofing
on rear flat roof.

Roll roofing

Limitations

Roof inspection limited/prevented by:

• Lack of access (too high/steep)

Front portion of main peaked roof could not be safety walked on.

Inspection performed:

• By walking on roof

on the flat roof and rear portion of peaked roof accessible from flat roof.

• With binoculars from the ground

of the front portion of peaked roof.

• From roof edge

of the front porch and bay window.

Recommendations

SLOPED ROOFING \ Asphalt shingles

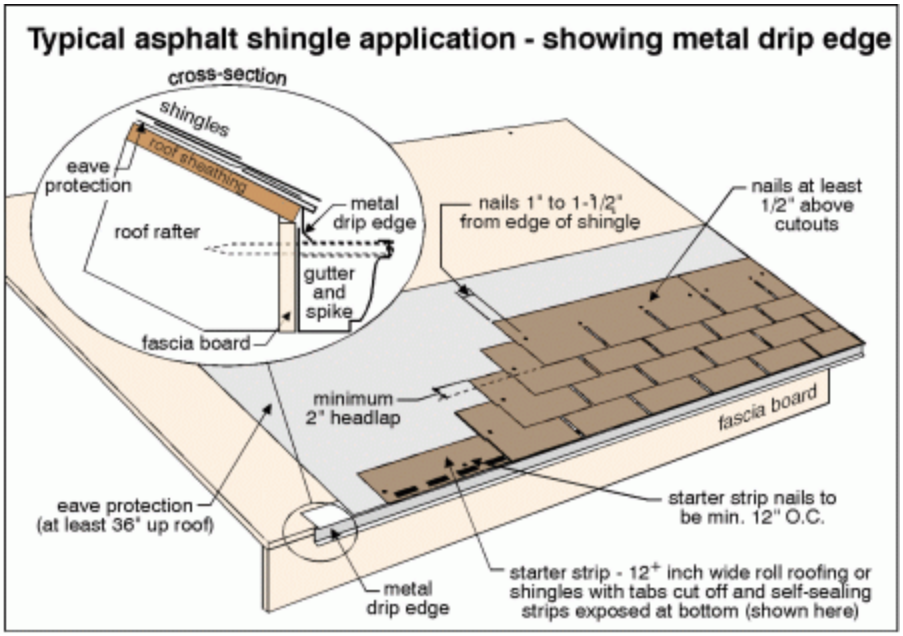
1. Condition: • Old, worn out

Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Front Porch

Task: Replace

Time: Immediate



Click on image to enlarge.

Old, worn out at front

2. Condition: • Cupping, curling, clawing
Implication(s): Chance of water damage to contents, finishes and/or structure
Location: Front
Task: Replace
Time: Immediate

Curling shingles on front of peak

SLOPED ROOF FLASHINGS \ Valley flashings

3. Condition: • Rust
Implication(s): Chance of water damage to contents, finishes and/or structure
Location: Transition of front porch to bay window
Task: Replace

Rust

SLOPED ROOF FLASHINGS \ Roof/wall flashings

4. Condition: • Damage, loose, open seams, patched

Rainwater running down wall may seep behind flashing and into porch roof structure.

Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Front

Task: Repair

opened seam of flashing

FLAT ROOFING \ Roll roofing

5. Condition: • Tree overhang - trim back
Implication(s): Trees drop debris which can promote moisture retention, and overhanging tree branches can rub on roofing in the wind, causing wear and tear.
Location: Rear
Task: Correct
Time: Immediate

Roll roofing

6. Condition: • Openings at seams or flashings
Implication(s): Chance of water damage to contents, finishes and/or structure
Location: West
Task: Repair

Openings at flashing of flat roof

Description

Gutter & downspout material: • Aluminum

Gutter & downspout discharge: • Below grade

Wall surfaces - masonry: • Brick

Wall surfaces : • Metal siding

Soffit and fascia: • Metal

Walkway: • Concrete

Deck: • Raised • Wood • Railings

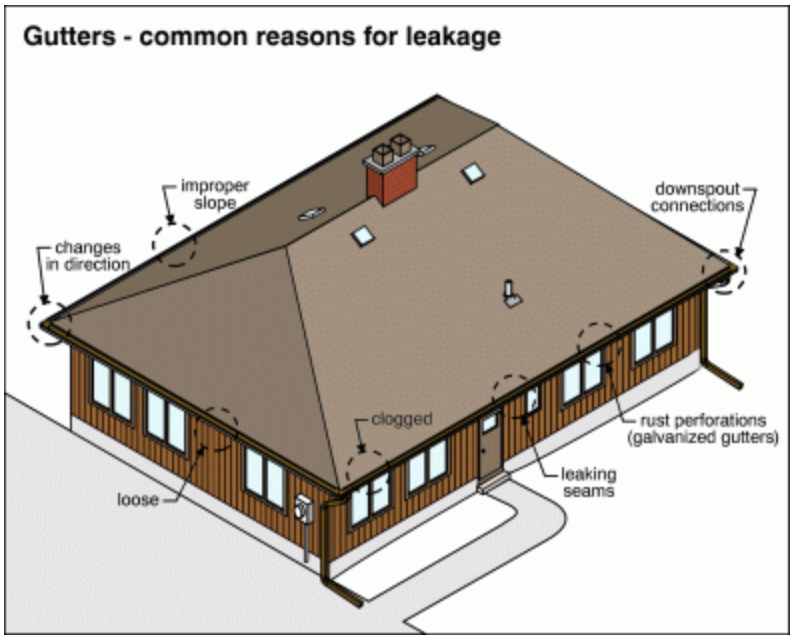
Recommendations

ROOF DRAINAGE \ Gutters

7. Condition: • Clogged

Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Rear Exterior



Click on image to enlarge.

Clogged rear eavestrough

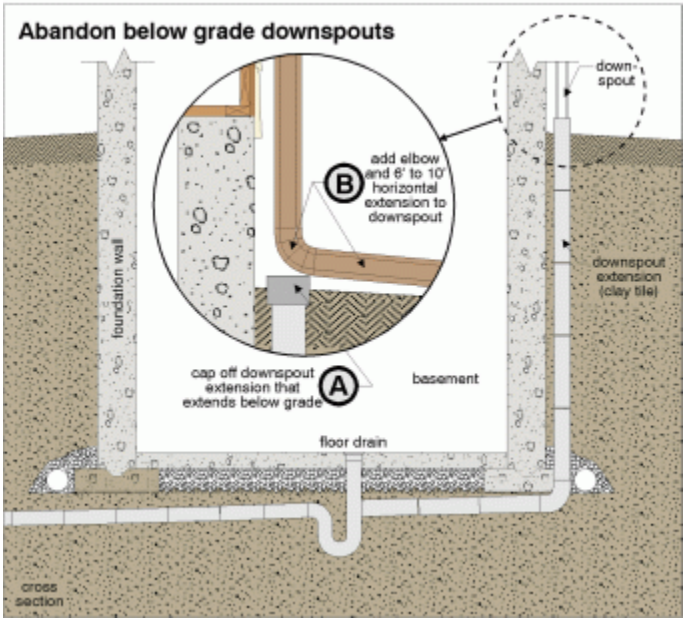
ROOF DRAINAGE \ Downspouts

8. Condition: • Downspouts discharging below grade

Potential source of basement leakage if underground drains back up.

Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Throughout



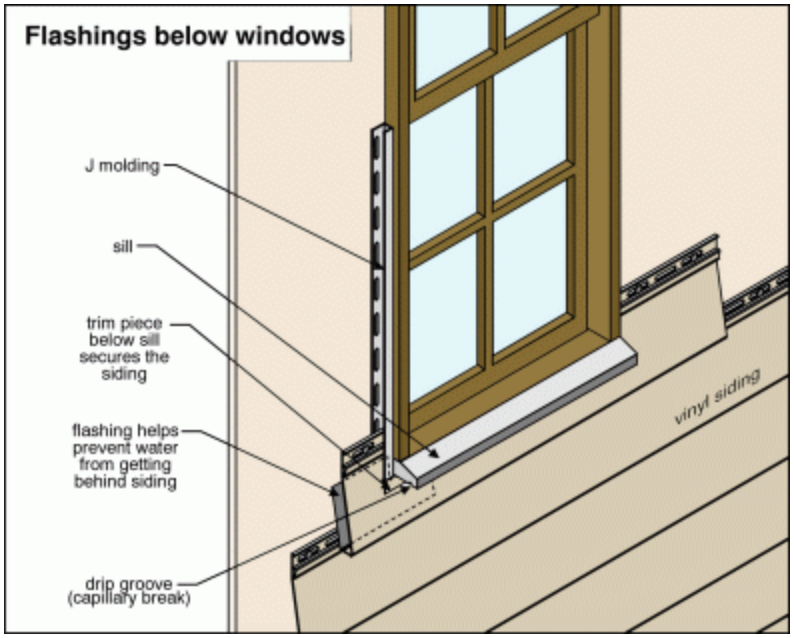
Click on image to enlarge.

WALLS \ Metal siding

9. Condition: • Gap
Implication(s): Increased chance of water penetrating wall.
Location: West
Task: Improve
Time: Immediate

Gap in siding

10. Condition: • Flashing and caulking defects
Location: Throughout around doors and windows and on sides of chimney
Task: Improve



Click on image to enlarge.

open joints around frames

unsealed areas

WALLS \ Brick, stone and concrete

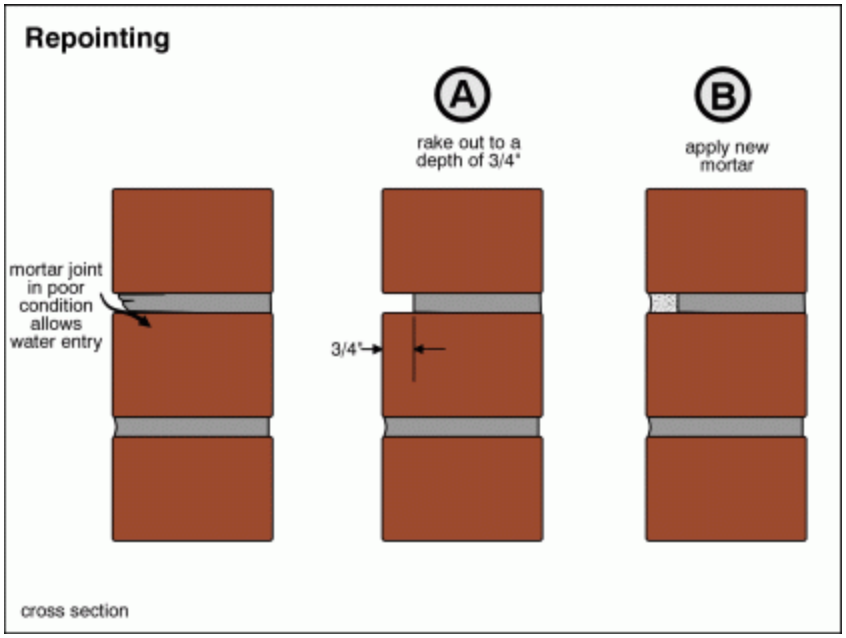
11. Condition: • Mortar deterioration

Small areas of mortar deterioration.

Location: Various

Task: Repair (tuck pointing)

Time: Yearly inspection by owner and tuck pointing by qualified mason



Click on image to enlarge.

Typical mortar deterioration

EXTERIOR GLASS \ Exterior trim

12. Condition: • Caulking loose, missing or deteriorated

Implication(s): Chance of water damage to contents, finishes and/or structure | Increased heating and cooling costs

Location: Basement windows

Task: Seal joints

Time: Immediate

Caulking loose, missing or deteriorated

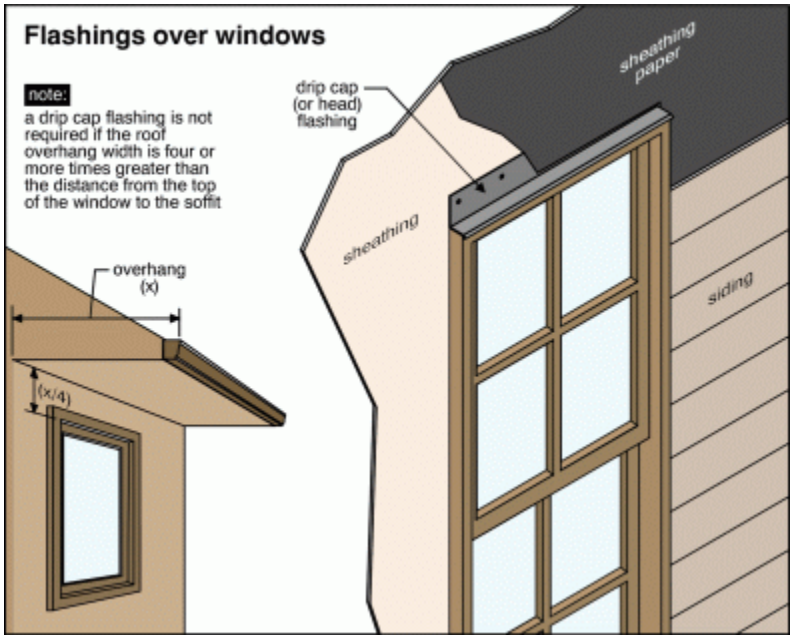
EXTERIOR GLASS \ Exterior drip caps

13. Condition: • Missing

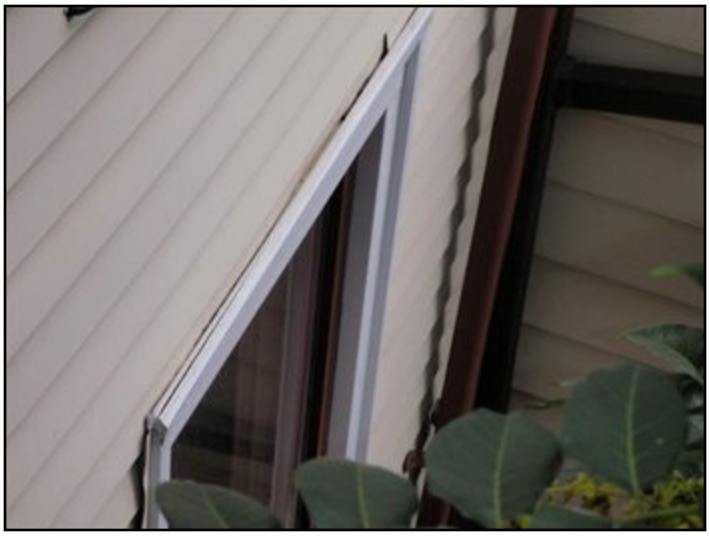
Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Throughout

Task: Provide



Click on image to enlarge.



typical trim over opening with no drip edge

EXTERIOR GLASS \ Storms and screens

14. Condition: • screen out of place
Implication(s): pests
Location: West Basement
Task: Repair
Time: Regular maintenance

basement window

DOORS \ Doors and frames

15. Condition: • Loose or poor fit

Implication(s): Chance of damage to finishes and structure

Location: Basement

Task: Repair

DOORS \ Exterior trim

16. Condition: • Caulking missing, deteriorated or loose

Implication(s): Chance of damage to finishes and structure

Location: Kitchen

Task: Repair/seal

Time: immediate

sliding door trim in poor condition

17. Condition: • No drip edge

Implication(s): Chance of damage to finishes and structure

Location: Throughout

Task: Improve

DOORS \ Exterior drip caps

18. Condition: • Missing

Implication(s): Chance of damage to finishes and structure

Location: Throughout

Task: Improve

Time: Less than 1 year

19. Condition: • Ineffective

Implication(s): Chance of damage to finishes and structure

Location: Throughout

BASEMENT ENTRANCES \ Basement stairwells

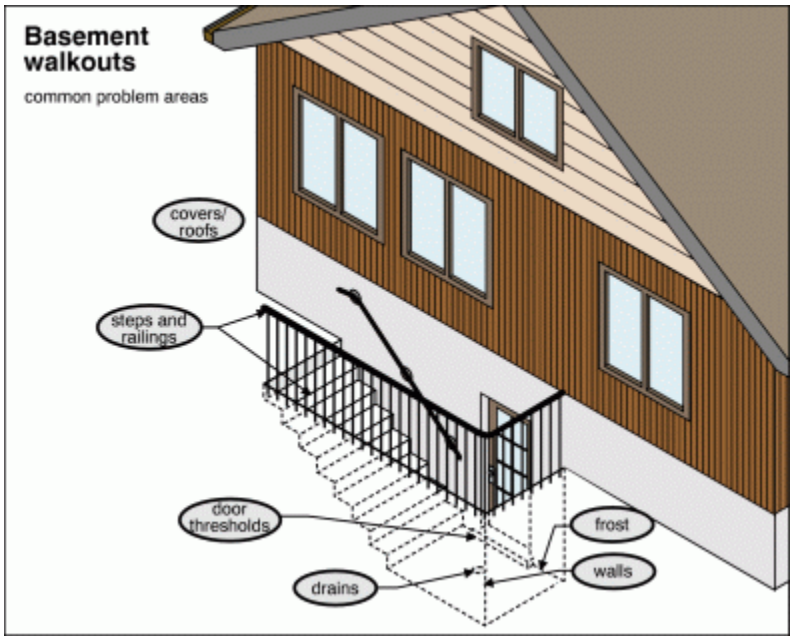
20. Condition: • Drains missing, clogged or undersized

Owner reports inadequate drainage.

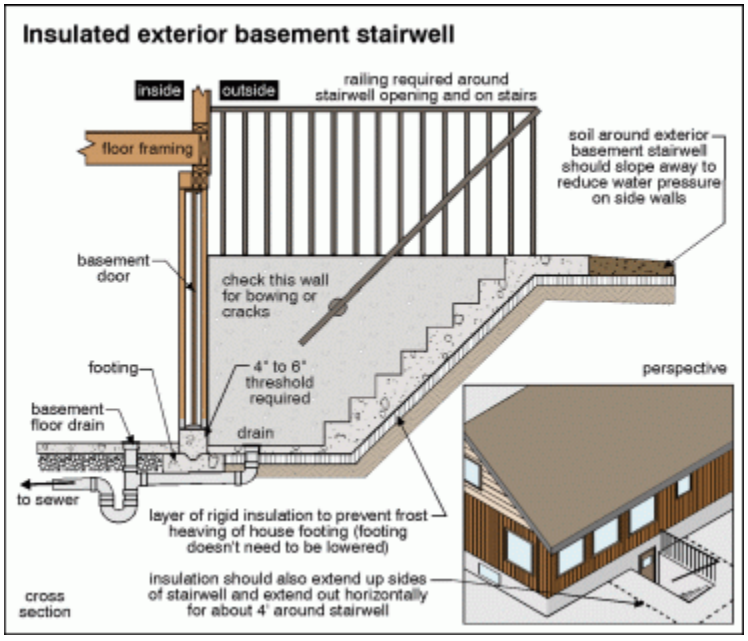
Implication(s): Chance of water damage to contents, finishes and/or structure

Location: Basement

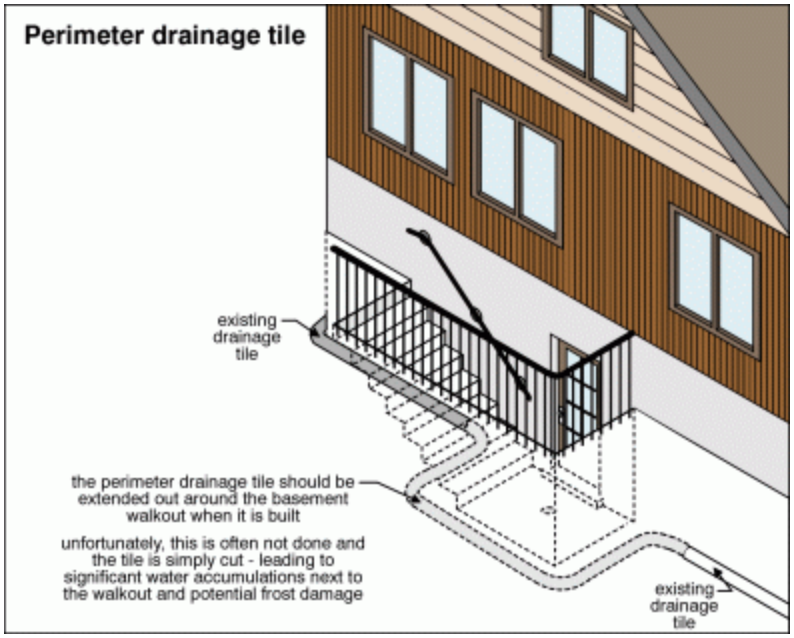
Task: Further evaluation by drain specialist.



Click on image to enlarge.



Click on image to enlarge.



Click on image to enlarge.

Stairwell drain

21. Condition: • Guard and handrail problems
missing
Implication(s): Fall hazard
Location: South Basement
Task: Provide
Time: Immediate

No handrail in basement stairwell

PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Beams

22. Condition: • Beam not secured to bracket
Implication(s): Structure may move
Location: Throughout Exterior
Task: Improve

Fastening missing

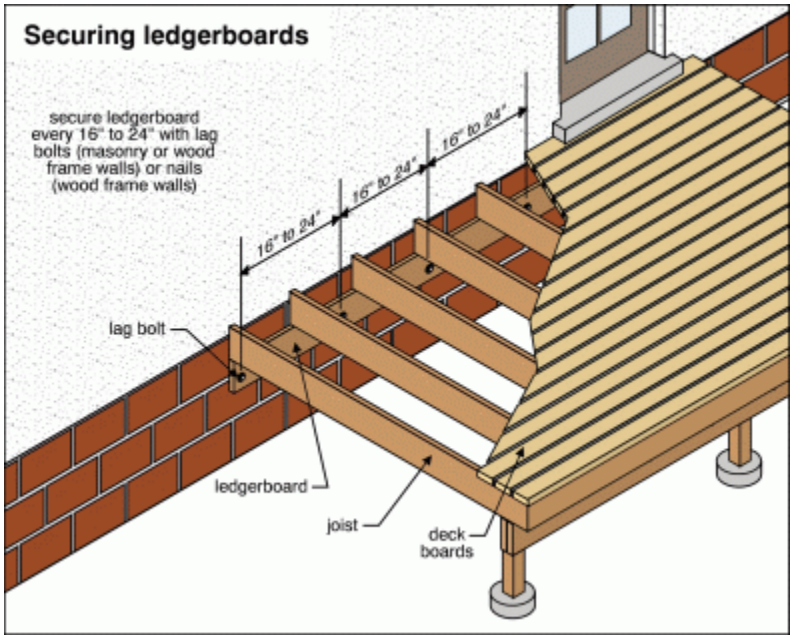
PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Joists

23. Condition: • Ledgerboard problems

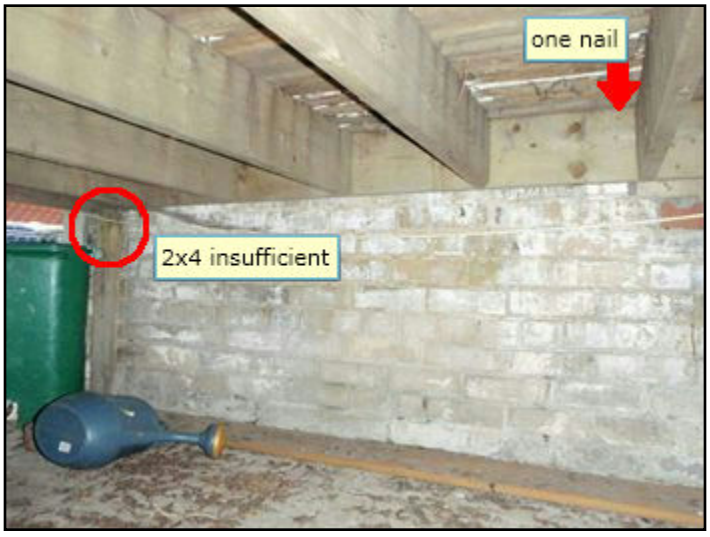
Attachment points of deck appears insufficient for proper support.

Implication(s): Weakened structure | Chance of movement

Task: Further evaluation



Click on image to enlarge.



West side of deck

East side of deck

PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Floors

24. Condition: • Rot or insect damage
Location: Throughout
Task: Replace deck floor boards

Rot damage in deck

PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Steps and landings

25. Condition: • Rot or insect damage
Implication(s): Weakened structure | Material deterioration
Location: Yard
Task: Replace deteriorated boards on steps

PORCHES, DECKS, STEPS, PATIOS AND BALCONIES \ Handrails and guards

26. Condition: • Loose
Railing supports are deteriorating. There should be no wiggle in deck railings.
Implication(s): Fall hazard
Location: Rear Deck
Task: Repair and monitor
Time: Immediate

rear porch nails coming out of support

LANDSCAPING \ Driveway

27. Condition: • Unsealed gap at house

Implication(s): Chance of water damage to contents, finishes and/or structure

Location: West First Floor

Task: Seal with appropriate caulk or concrete patch

Time: Immediate

Description

Configuration: • Basement

Foundation material: • Brick

Floor construction: • Joists • Concrete

Exterior wall construction: • Wood frame, brick veneer

Roof and ceiling framing: • Rafters/roof joists

Limitations

Attic/roof space: • Inspected from access hatch

Recommendations

FOUNDATIONS \ Foundation

28. Condition: • Wood/soil contact

Remains of wood post in foundation at fence line. This makes structure more vulnerable to water and pests.

Location: West Exterior

Task: Repair. ie. remove external portion of wood and reseal wall

Wood/soil contact

WALLS \ Party walls

29. Condition: • Incomplete in attic

Improve seal around edges

Implication(s): Increased fire hazard

Location: East Attic

Task: Improvement recommended

Time: Immediate

example of gaps in firewall of attic

ROOF FRAMING \ Sheathing

30. Condition: • Water stains

This may have occurred before rear roof was redone, however it is good practice to inspect yearly and during heavy rainfalls to determine if staining is increasing or wood is wet

Implication(s): Material deterioration

Location: Attic

Task: Monitor

Water stains

Description

Service entrance cable and location: • Overhead

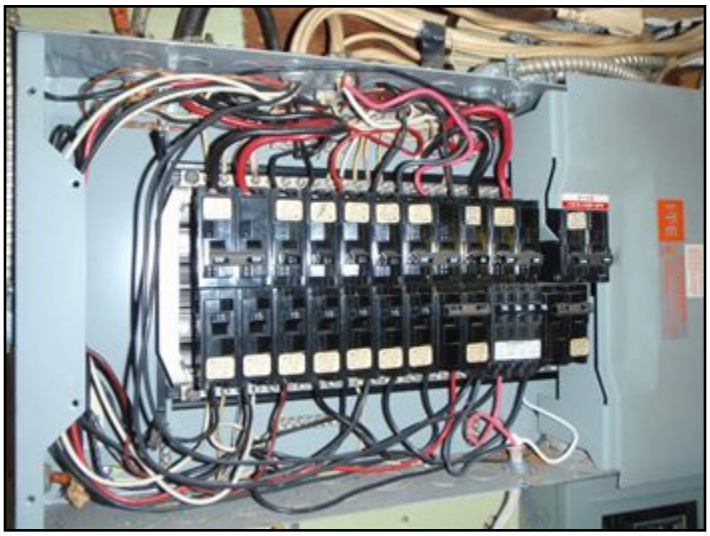
Main disconnect/service box rating: • 100 Amps

System grounding material and type: • Copper - water pipe

Distribution panel type and location:

• Breakers - basement

Breakers - basement



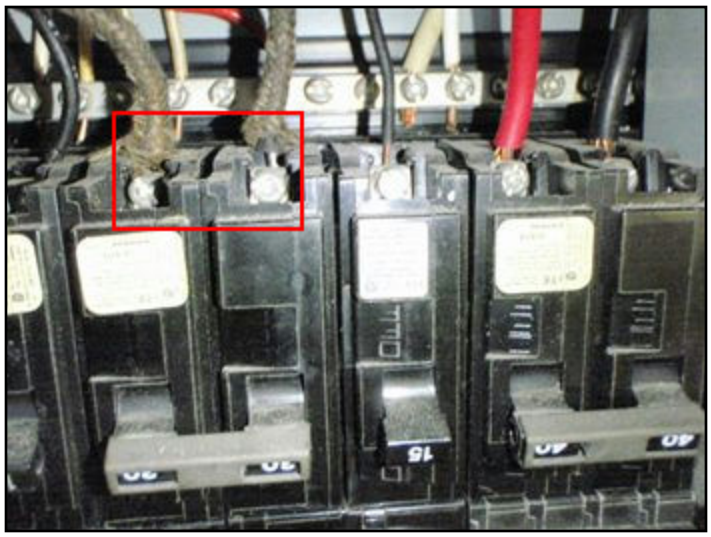
Inside panel cover - basement

Distribution wire material and type:

• Copper - non-metallic sheathed

• Aluminum - non-metallic sheathed

Visible in electrical panel - 30 Amp labelled "Dryer"



Aluminum - non-metallic sheathed

Type and number of outlets (receptacles):

• Grounded and ungrounded - minimal

Typically one or two receptacles per room.

Circuit interrupters: Ground Fault (GFCI) & Arc Fault (AFCI): • No GFCI • No AFCI

Smoke detectors: • Present

Recommendations

SERVICE BOX, GROUNDING AND PANEL \ System grounding

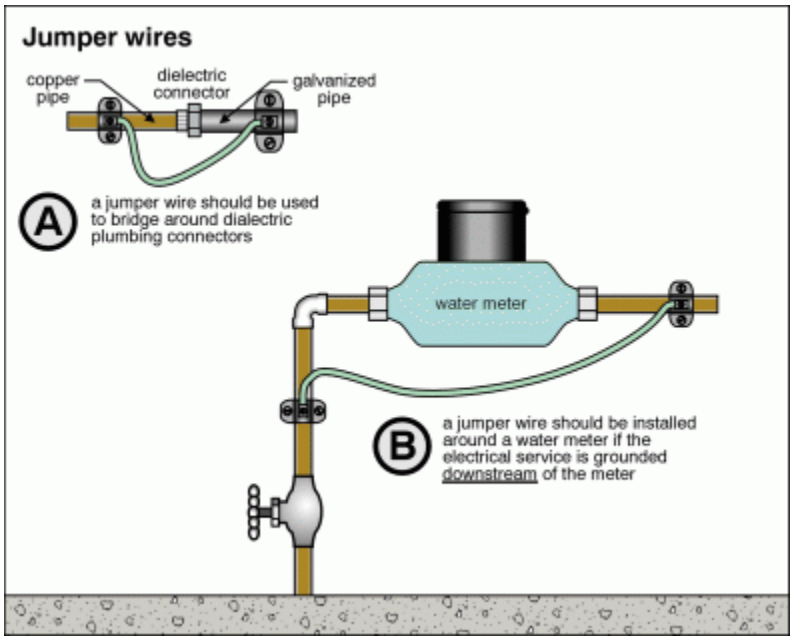
31. Condition: • No jumper for meters and valves

Water meter

Implication(s): Electric shock

Location: Front Basement

Task: Provide



Click on image to enlarge.

SERVICE BOX, GROUNDING AND PANEL \ Distribution panel

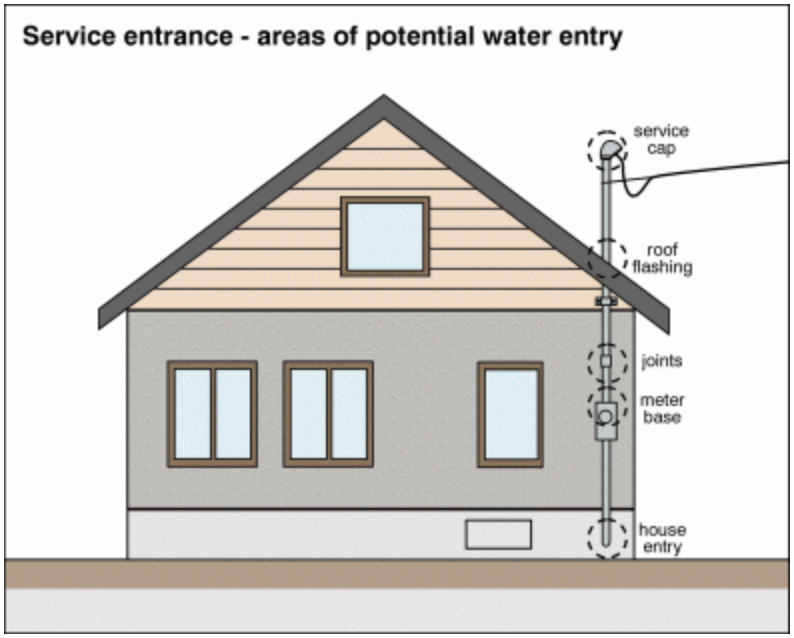
32. Condition: • Rust or water in panel

Slight rust staining in bottom right corner of panel.

Implication(s): Electric shock | Fire hazard

Location: Basement

Task: Ask electrician to check inside main breaker section



Click on image to enlarge.

SERVICE BOX, GROUNDING AND PANEL \ Panel wires

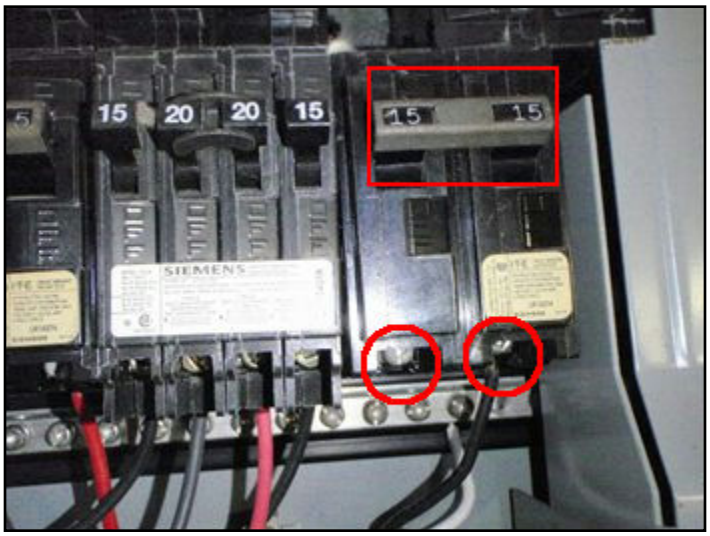
33. Condition: • Suspect

Implication(s): Safety - wiring appears unusual and possibly discoloured from heat damage.

Location: Basement

Task: Have panel inspected by licensed electrician

Time: Immediate



only one wire on double pole breaker

Discoloured wires

DISTRIBUTION SYSTEM \ Wiring - installation

34. Condition: • Open splices
Implication(s): Electric shock | Fire hazard
Location: Basement Utility Room

Unprotected splice

35. Condition: • Not well secured
Electrical cable tied to water line with electrical tape
Implication(s): Electric shock | Fire hazard
Location: Utility Room
Task: Remove electrical tape. Support cable appropriately
Time: Immediate

Not well secured

36. Condition: • Extension cord used as permanent wiring
Implication(s): Electric shock | Fire hazard
Location: West Living Room and various other locations
Task: Improve; reduce number of extension cords used, ensure any extension cords are newer and CSA labelled. Ideally, install more electrical outlets so that extension cords are not required.

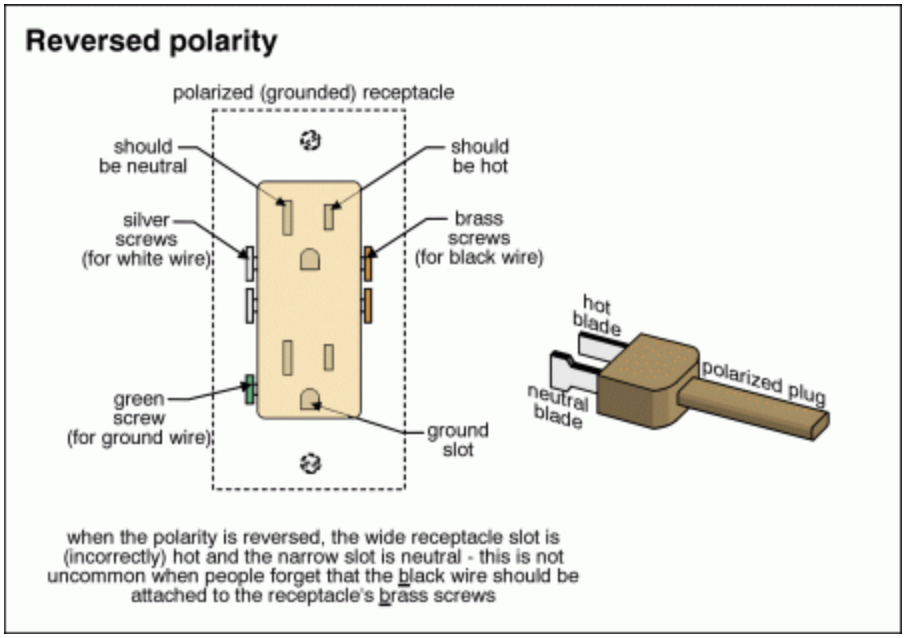
DISTRIBUTION SYSTEM \ Lights

37. Condition: • Inoperative
A live light fixture with empty sockets is a shock hazard. Install light bulbs in all sockets. If fixture is too bright, use lower amperage bulbs.
Implication(s): Inadequate lighting
Location: Basement Bathroom
Task: Ensure all sockets are working. If they are not working there may be a wiring problem which could be a fire hazard. Repair by electrician. Fixture may need to be replaced.
Time: Immediate

Inoperative and missing bulbs

DISTRIBUTION SYSTEM \ Outlets (receptacles)

38. Condition: • Reversed polarity
Receptacle tester indicates wiring is incorrect.
Implication(s): Electric shock
Location: Basement Bathroom
Task: Repair by electrician.
Time: Immediate



Click on image to enlarge.

39. Condition: • Ungrounded
Location: Various
Task: Upgrade
Time: Immediate

Ungrounded 2 prong type

40. Condition: • Ground needed for 3-slot outlet

Implication(s): Electric shock

Location: Northwest Living Room and upstairs bathroom

Task: Repair

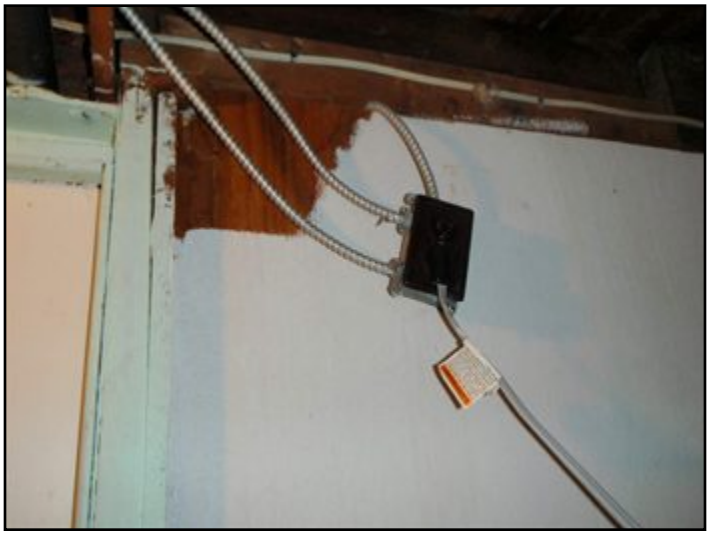
Time: Immediate

41. Condition: • Loose

Location: Basement Laundry Area

Task: Mount securely

Time: Immediate



Loose receptacle

42. Condition: • Overheating

Implication(s): Fire hazard

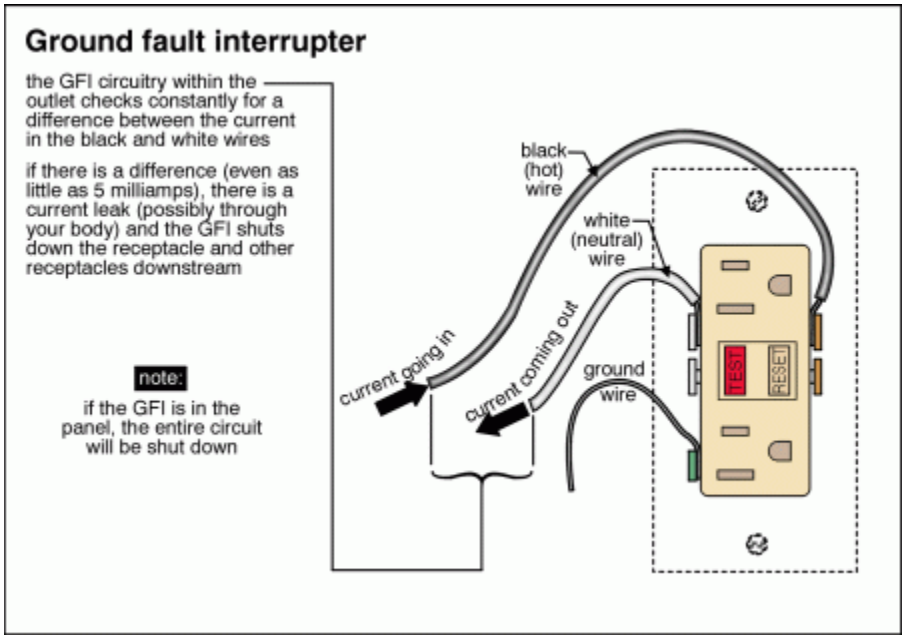
Location: Basement

Task: Further evaluation

Time: Immediate

Evidence of electrical overheating

43. Condition: • No GFI (Ground Fault Interrupter)
Implication(s): Electric shock
Location: Kitchen, bathrooms, exterior
Task: Upgrade



Click on image to enlarge.

DISTRIBUTION SYSTEM \ Outlets (receptacles) - number or location

44. Condition: • Too few outlets

No receptacles over countertops

Implication(s): Nuisance

Location: Kitchens and most rooms

Task: Improve

DISTRIBUTION SYSTEM \ Cover plates

45. Condition: • Missing

Cover plates prevent accidental contact with wiring. Photos illustrate several locations.

Location: Various

Task: Install plates

Time: Immediate

Basement ceiling switch

Upstairs Bedroom receptacle

Boiler electrical box

DISTRIBUTION SYSTEM \ Smoke detectors

46. Condition: • Test operation monthly

Implication(s): Fire safety

Location: All floors

Task: Service annually

Description

Fuel/energy source: • Gas

System type: • Boiler

Boiler manufacturer:
• Weil McLain
Model number: CGI4PIN52 *Serial number:* CP4262572

Heat distribution: • Radiators

Approximate capacity: • 85,000 BTU/hr

Efficiency: • Mid-efficiency

Approximate age: • 10 years

Typical life expectancy: • Boiler (cast iron) 25 to 50 years

Main fuel shut off at: • Meter • Basement

Fireplace:
• Wood-burning fireplace - not in service
blocked with Styrofoam
• Non-functional

Chimney/vent: • Metal • Sidewall venting

Combustion air source: • Interior of home

Recommendations

GAS HOT WATER BOILER \ Gas burners

47. Condition: • Rust

Rust flakes indicate corrosion is occurring. Have boiler system evaluated by a qualified gas boiler technician
Implication(s): Shortened life expectancy of material | Material deterioration
Location: Furnace Room
Task: Further evaluation
Time: Immediate

Rust below burners

GAS HOT WATER BOILER \ Pressure relief valve

48. Condition: • No pipe extension

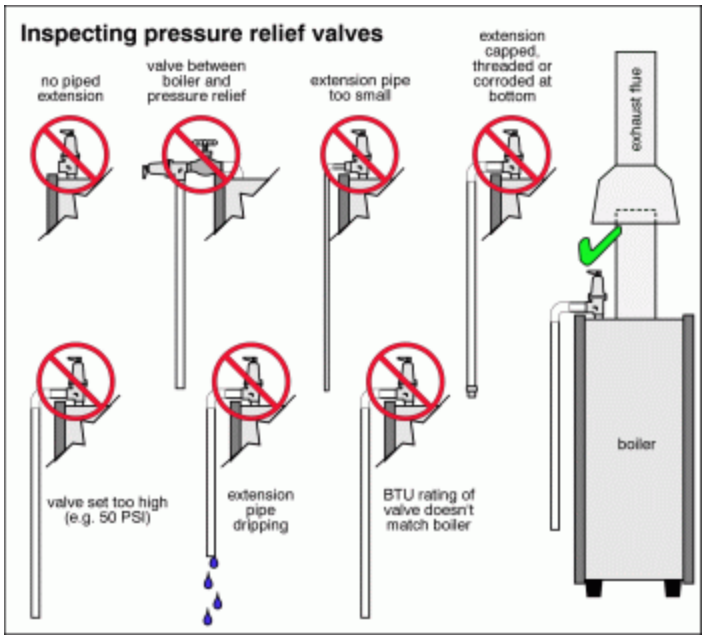
There should be a pipe attached to this valve to direct water down close to the floor in case of overheating

Implication(s): Steam explosion

Location: Basement

Task: Provide

Time: Immediate



Click on image to enlarge.

No pipe extension

GAS HOT WATER BOILER \ Pipes

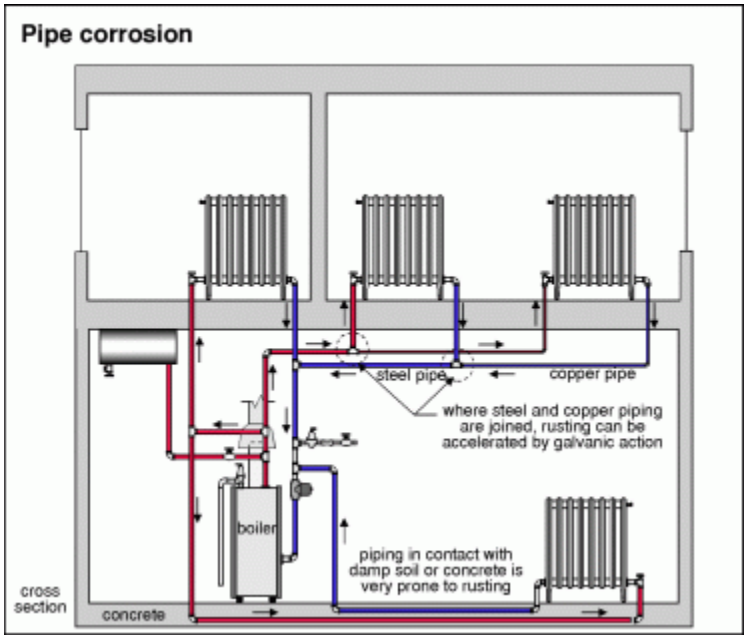
49. Condition: • Pipe wrap damaged - possibly contains asbestos
Implication(s): Asbestos in material is a health hazard if particles from wrapping become airborne.
Location: Basement
Task: Encapsulate or remove wrapping by asbestos removal experts
Time: Immediate

Boiler water pipe wrap partially removed

Boiler pipe wrap

Boiler pipe wrap torn above cabinet

50. Condition: • Rust
Monitor piping for leaks.
Connections between cast iron piping and copper should have dialectric fittings to prevent corrosion by contact between dissimilar metals. Consult with plumbing and heating gas boiler specialist.
Implication(s): Chance of water damage to contents, finishes and/or structure | Increased heating costs | Reduced comfort
Location: Various Basement Laundry Area
Task: Further evaluation Monitor
Time: Less than 1 year



Click on image to enlarge.

Rust at boiler pipe connection

GAS HOT WATER BOILER \ Radiators, convectors and baseboards

51. Condition: • Poor Support
Implication(s): Inadequate supports may cause strain on piping and potential damage or injury if support fails.
Location: Second Floor Bathroom
Task: Improve
Time: Immediate

Rad legs poorly supported

Tied to wall with wire

52. Condition: • Cold

Radiator does not heat up evenly, may need to be bled to remove trapped air.

Implication(s): Increased heating costs | Reduced comfort

Location: Front Second Floor Bedroom

Task: Further evaluation, service by qualified plumbing and heating technician.

Time: Immediate

Description

Air conditioning type: • Ductless system

Manufacturer: • Mitsubishi

Model number: MUM 18NW *Serial number:* 46903093

Indoor unit

A/C exterior data plate

Outdoor unit - Compressor and fan

Cooling capacity: • 18,000 BTU/hr

Compressor approximate age: • 7 years

Limitations

Inspection limited/prevented by: • Low outdoor temperature

Description

Attic/roof insulation material:

• Cellulose

Approximately 8" depth insulation in attic

Attic insulation

Cellulose insulation

Attic/roof insulation amount/value: • R-28

Attic/roof ventilation: • Roof vent

Wall insulation material: • Not determined

Limitations

Attic inspection performed: • From access hatch

Recommendations

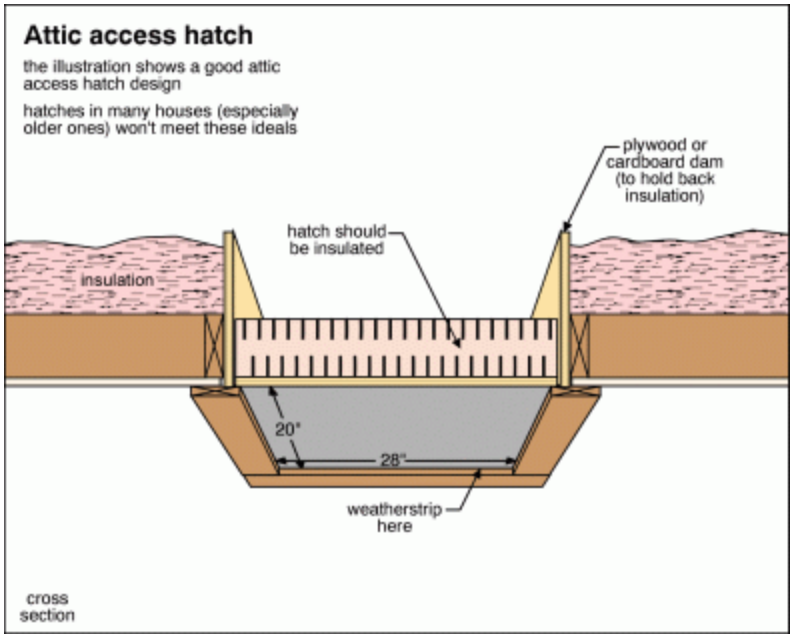
ATTIC/ROOF \ Hatch

53. Condition: • Not insulated and not weatherstripped

Location: Second Floor Hallway Closet

Task: Improve

Time: Less than 1 year



Click on image to enlarge.

Attic hatch from above

WALLS \ Insulation

54. Condition: • Too little

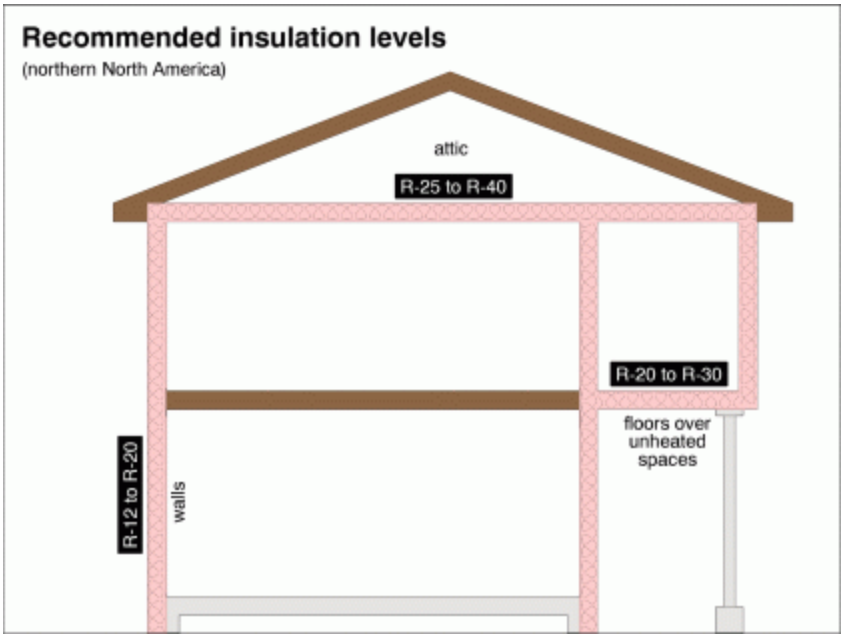
While wall insulation was not verified, it is likely with this age, type of wall finishes and history of home, that there is little or no insulation in the exterior walls. If wall cavity is sufficient, a blown in type of insulation such as cellulose could be installed. Consult an insulation specialist for advice.

Implication(s): Increased heating and cooling costs | Reduced comfort

Location: Throughout

Task: Upgrade

Time: Discretionary



Click on image to enlarge.

Description

Water supply source: • Public

Service piping into building:

• Galvanized steel

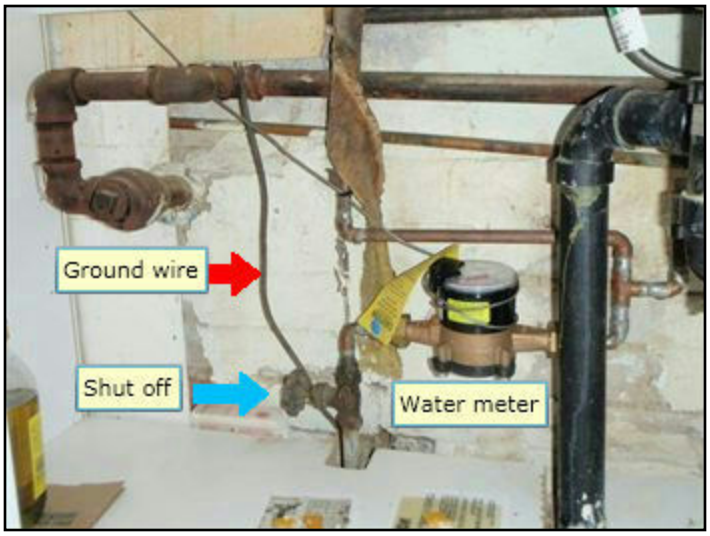
Scraping of pipe surface upstream of meter shows a grey surface which appears to be galvanized steel. This area is difficult to access.

Galvanized steel

Supply piping in building: • Copper

Main water shut off valve at the:

• Front of the basement



Water supply

Water heater fuel/energy source: • Electric

Water heater type: • Owned

Water heater manufacturer:
• General Electric
Model number: GE60T6CB00 *Serial number:* 0102J17960

Tank capacity: • 270 Litres

Water heater approximate age: • 10 years

Typical life expectancy: • 8 to 12 years

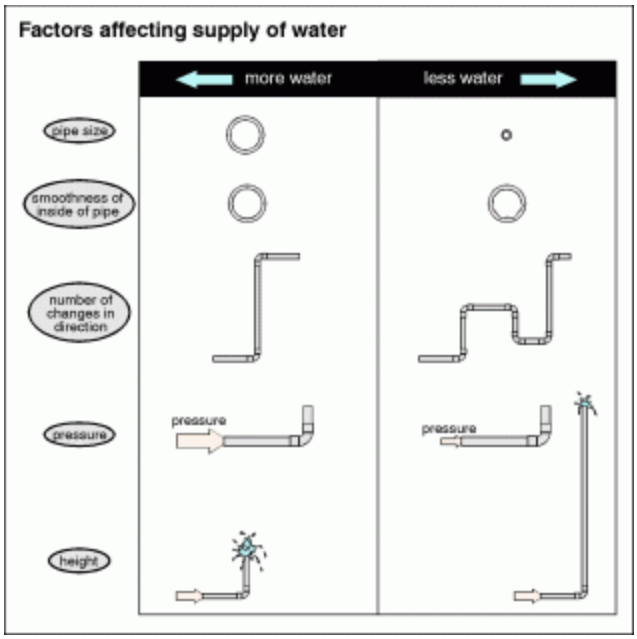
Waste piping in building: • ABS plastic

Floor drain location: • Near laundry area

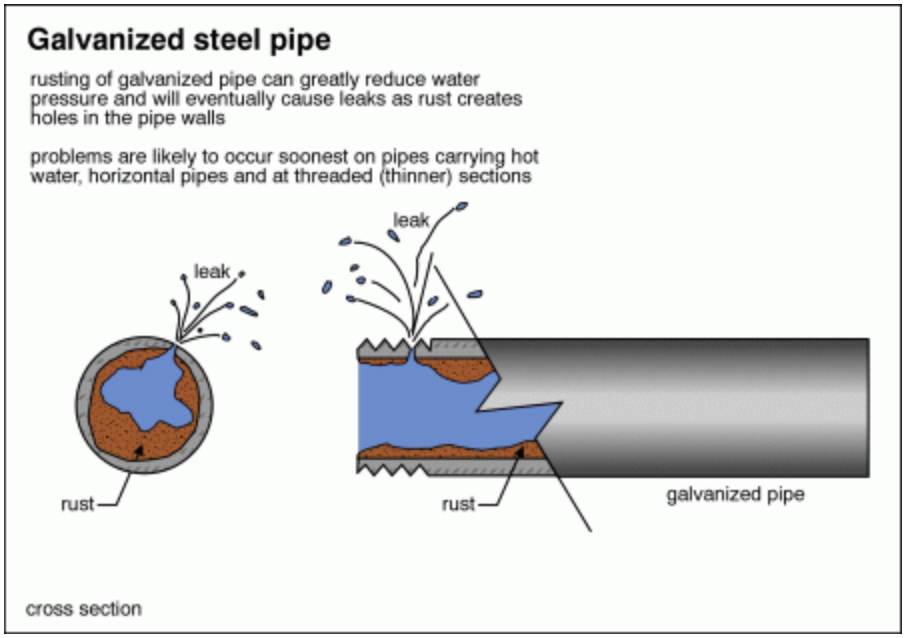
Recommendations

SUPPLY PLUMBING \ Supply piping in building

55. Condition: • Poor pressure or flow
Bathtub
Implication(s): Reduced water pressure and volume
Location: Bathroom
Task: Upgrade service piping to copper



Click on image to enlarge.



Click on image to enlarge.

WATER HEATER \ Life expectancy

56. Condition: • Near end of life expectancy

Budget for replacement of water heater.

WATER HEATER \ Temperature/pressure relief valve

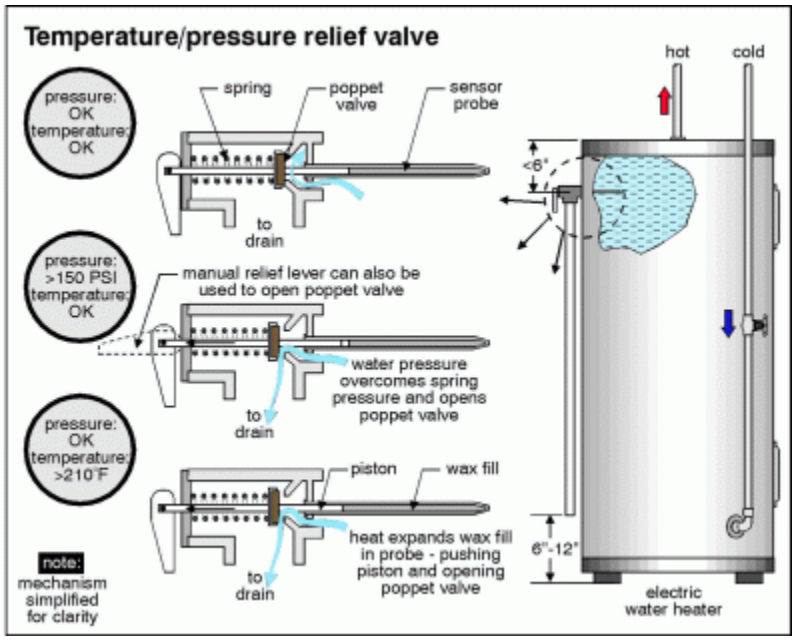
57. Condition: • Discharge tube too short

Implication(s): Scalding

Location: Basement Furnace Room

Task: Provide - have plumber install correct pipe and do a service check on water heater.

Time: Immediate



Click on image to enlarge.

Discharge tube too short

58. Condition: • Discharge tube threaded
The danger of a threaded end is that someone may be tempted to screw on a cap, which would mean the relief valve would not discharge in case of high temperature or pressure.
Implication(s): Steam explosion
Task: Replace with pipe extended to within 6-12" of floor
Time: Immediate

WASTE PLUMBING \ Floor drain

59. Condition: • Covered. Owner advised location of drain so it could be uncovered for inspection.
Implication(s): Carpet over drain will impair drainage if floor floods.
Location: Laundry Area
Task: Make sure drain is exposed at all times.
Time: Immediate

Floor drain

FIXTURES AND FAUCETS \ Faucet

60. Condition: • Loose

Tap mount is loose due to rotted counter top and tap swivel is stiff.

Location: Kitchen first floor

Task: Replace at same time counter is replaced

FIXTURES AND FAUCETS \ Hose bibb

61. Condition: • Damage

Have qualified plumber replace bent pipe. Avoid long unsupported pipe runs.

Implication(s): Leakage | Equipment inoperative

Location: Front Exterior

Task: Repair

Bent pipe going to outside tap

Description

Major floor finishes:

- Hardwood
- Resilient

..... (bathroom linoleum)

- Vinyl
- Tile

Major ceiling finishes: • Plaster/drywall

Windows: • Fixed • Single/double hung • Sliders • Aluminum

Glazing:

- Single
- Double

Age of windows - prox 24 yrs

Exterior doors - type/material: • Hinged • Storm • Solid wood

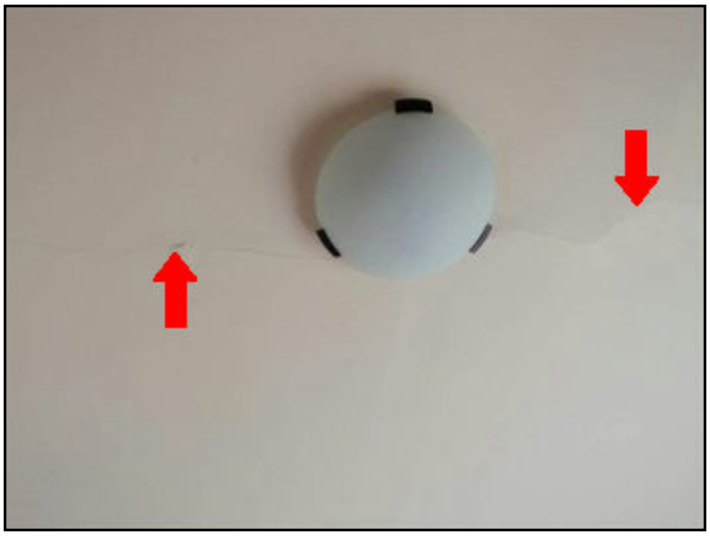
Recommendations

CEILINGS \ Plaster or drywall

62. Condition: • Cracked

Location: Master Bedroom

Task: Monitor for deterioration



Ceiling crack

WINDOWS \ Sashes

63. Condition: • Pane installed backwards
Location: South Bedroom outer pane
Task: Correct

WINDOWS \ Hardware

64. Condition: • Broken
latches
Implication(s): Cosmetic defects | System inoperative or difficult to operate
Location: North and South Bedrooms
Task: Repair

Broken latch. Note exterior pane backwards

WINDOWS \ Storms and screens

65. Condition: • Missing
Install window screens where missing.
Implication(s): Chance of pests entering house | Increased heating costs | Reduced comfort
Location: West First Floor Dining Room

DOORS \ Doors and frames

66. Condition: • Mildew
Implication(s): excess moisture and/or lack of air circulation
Location: Basement Laundry Area
Task: Improve

67. Condition: • Stiff
.....outer sliding door very hard to move.
Implication(s): Reduced operability
Location: Rear Kitchen
Task: Repair or replace

68. Condition: • Weatherstripping missing or ineffective
Implication(s): Chance of water entering house | Increased heating and cooling costs | Reduced comfort
Location: Front First Floor Hallway
Task: Provide
Time: Discretionary

CARPENTRY \ Countertops

69. Condition: • Loose or missing pieces

Deterioration of countertop is causing it to sag behind the sink, breaking the seal at the kitchen tap mount. This promotes further water damage when water goes under the tap mount.

Location: Kitchen first floor

Task: Replace counter

Counter sagging under tap

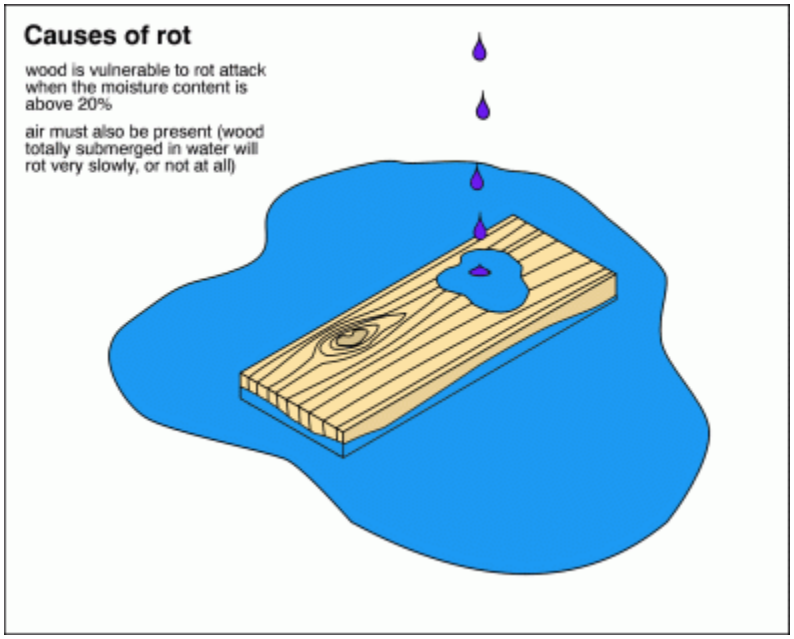
70. Condition: • Rotted substrate

Water damage to counter at kitchen sink taps

Location: Kitchen First floor

Task: Replace

Time: When remodelling



Click on image to enlarge.

Rotted counter under kitchen sink

STAIRS \ Spindles or balusters

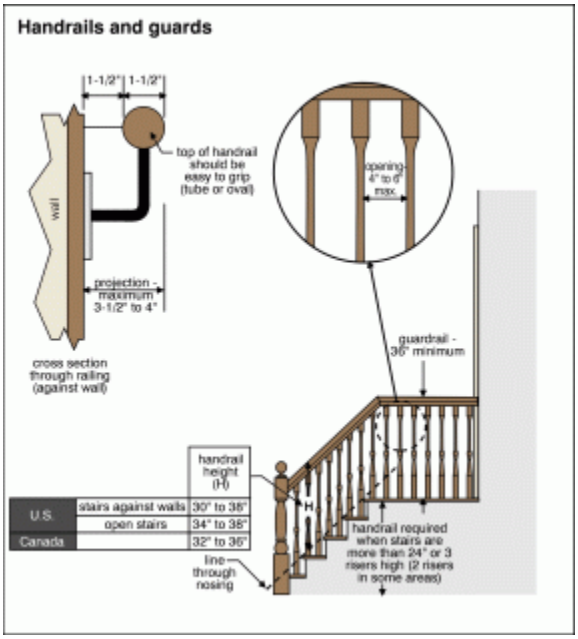
71. Condition: • Loose

Implication(s): Fall hazard

Location: First Floor Dining Room

Task: Repair

Time: Immediate



Click on image to enlarge.

Loose baluster top

BASEMENT \ Wet basements - vulnerability

72. Condition: • Check drains

Implication(s): Drain in laundry area floor is far away from water heater. If water heater leaks, entire basement may get wet. Recommend drain be installed close to water heater. It is possible there is a second drain in the basement that is covered. Have drain lines inspected and tested to ensure they are in good condition, properly installed and fully functional.

Location: Throughout Basement

Task: Further evaluation by drain specialist

EXHAUST FANS \ Exhaust duct

73. Condition: • Termination point not found

Fans exhausting moist air inside walls and ceilings can cause water damage.

Implication(s): Chance of condensation damage to finishes and/or structure

Location: Basement Bathroom

Task: Ensure fan is properly terminated to outside.

Time: Immediate

END OF REPORT

ABOUT YOUR HOUSE

CE 3

Asbestos

WHAT IS ASBESTOS?

Asbestos is a natural mineral with unusual qualities. It is strong enough to resist high temperatures, chemical attack and wear. A poor conductor, it insulates well against heat and electricity.

Asbestos crystals become long, flexible, silky fibres, so it can be made into a wide variety of forms. It can be spun into yarn, woven into cloth or braided into rope. Asbestos can also be added to materials as diverse as cotton and cement.

This combination of properties gives asbestos performance capabilities that are difficult to match.

WHAT HAS ASBESTOS BEEN USED FOR?

Asbestos has been used in hundreds of applications and products over the past 4,500 years. The ancient Greeks wove it into oil lamp wicks, funeral shrouds and ceremonial tablecloths.

During the 1800s, it insulated the hot engines, boilers and piping that powered the Industrial Revolution.

For half a century, until the 1980s, asbestos was used in office buildings, public buildings and schools. It insulated hot water heating systems, and was put into walls and ceilings as insulation against fire and sound.

Asbestos has also been widely used in transportation and electrical appliances, frequently mixed with, and encased in, other materials.

Asbestos has also been found in many products around the house. It has been used in clapboard; shingles and felt for roofing; exterior siding; pipe and boiler covering; compounds and cement, such as caulk, putty, roof patching, furnace cement and driveway coating; wallboard; textured and latex paints; acoustical ceiling tiles and plaster; vinyl floor tiles; appliance wiring; hair dryers; irons and ironing board pads; flame-resistant aprons and electric blankets; and clay pottery. Loose-fill vermiculite insulation may contain traces of “amphibole” asbestos.

HOW HAS THE USE OF ASBESTOS CHANGED?

When it became evident that regular exposure to asbestos on the job involved health risks, the public became more concerned about exposure to asbestos in offices and schools, and, eventually, about all asbestos products.

This concern has led to a dramatic decline in asbestos use since the early 1980s.The use of asbestos insulation in buildings and heating systems has virtually disappeared. Residential use, for roofing, flooring and appliances, continues to decrease.

While alternative products are being developed to replace asbestos, products sold today containing asbestos are regulated under the *Hazardous Products Act*. Asbestos can be used safely, and public concern has led to improved product design and manufacture. Asbestos is now better encapsulated and sealed to reduce the escape of fibres.

Canada

CMHC SCHL
HOME TO CANADIANS

About Your House

Asbestos

Asbestos is valuable in many applications because it has been difficult to find comparable substitute materials. For example, it is still an important component of brake lining and clutch facings.

WHAT HEALTH PROBLEMS ARE ASSOCIATED WITH EXPOSURE TO ASBESTOS?

Health Canada states that the asbestos content of a product does not indicate its health risk.

Asbestos poses health risks only when fibres are in the air that people breathe. Asbestos fibres lodge in the lungs, causing scarring that can ultimately lead to severely impaired lung function (asbestosis) and cancers of the lungs or lung cavity.

Concern for the health of asbestos workers was expressed as long ago as the late 1800s.The risks became more evident in the late 1960s, when workers who had been heavily exposed 20 to 30 years earlier showed increased incidence of lung disease. Occupational exposure is now strictly regulated by provincial governments.

WHEN CAN ASBESTOS BE A PROBLEM IN THE HOME?

Today, far fewer products in the home contain asbestos. Current products that do contain the material are better made to withstand wear and use.

However, frequent or prolonged exposure to asbestos fibres may still bring health risks. This can happen with the release of fibres into the air when asbestos-containing products break down, either through deterioration as they age or when they are cut. People can put themselves at risk—often without realizing it—if they do not take proper precautions when repairs or renovations disturb asbestos-containing materials. This can occur in a number of situations:

- Disturbing loose-fill vermiculite insulation which may contain asbestos
- Removing deteriorating roofing shingles and siding containing asbestos, or tampering with roofing felt that contains asbestos
- Ripping away old asbestos insulation from around a hot water tank
- Sanding or scraping vinyl asbestos floor tiles
- Breaking apart acoustical ceilings tiles containing asbestos
- Sanding plaster containing asbestos, or sanding or disturbing acoustical plaster that gives ceilings and walls a soft, textured look
- Sanding or scraping older water-based asbestos coatings such as roofing compounds, spackling, sealants, paint, putty, caulking or drywall
- Sawing, drilling or smoothing rough edges of new or old asbestos materials

HOW TO MINIMIZE THE ASBESTOS RISKS IN THE HOME?

If you do not know if products in your home contain asbestos, have an experienced contractor inspect them. If there is asbestos, the best interim measure (unless the product is peeling or deteriorating) is to seal the surface temporarily so that fibres will not be released into indoor air. If the product is already protected or isolated, simply leave it alone.

It is a complex and expensive matter to remove asbestos, and should be done by an experienced contractor.

When disturbing an asbestos product, maximum precautions must be taken to safeguard the workers and anybody else who may be nearby. Asbestos dust must remain within the work area so that it cannot be breathed in by unprotected persons.

It is essential to take adequate precautions. Everybody who works with asbestos should always wear an approved face mask and gloves, along with protective clothing. Be sure to tape sleeve and trouser cuffs, and wash clothes separately after use. Keep the work area moist to keep dust and fibre particles from floating into the air. Isolate the work space.

Reduce the air pressure to prevent asbestos fibres from escaping from the work area, and filter the exhaust air. Dispose of all waste appropriately, according to the guidelines of your provincial department of the environment. Other removal methods may be warranted for special conditions- consult an expert.

VERMICULITE INSULATION

Some vermiculite may contain asbestos.

- Do not disturb loose-fill vermiculite insulation.
- Do not store items near vermiculite insulation, if the insulation can be disturbed.
- Do not allow children near loose fill vermiculite insulation.
- If activities are planned that will disturb vermiculite, consult a certified asbestos removal company.

Figure 1 Vermiculite Insulation

About Your House

Asbestos

WHERE CAN YOU GET MORE INFORMATION ON ASBESTOS?

For information on how to minimize exposure to asbestos refer to: *It's Your Health – Vermiculite Insulation Containing Asbestos,* Health Canada.
http://www.hc-sc.gc.ca

For information on occupational exposure to asbestos, contact:
Canadian Centre for Occupational Health and Safety (CCOHS)
135 Hunter Street East
Hamilton, ON L8N 1M5
Phone: 1 905 570-8094
Toll-Free: 1 800 668-4284
Fax: 1 905 572-2206
Web Site: www.ccohs.ca

For contractors who specialize in asbestos abatement and removal, look in the Yellow Pages™ under "Asbestos".

U.S. EPA's Asbestos Home Page at:
http://www.epa.gov/oppt/asbestos/index.html

To find more About Your House fact sheets plus a wide variety of information products, visit our website at www.cmhc.ca. You can also reach us by telephone at 1-800-668-2642 or by fax at 1-800-245-9274.

Priced Publications

Building Materials for the Environmentally Hypersensitive	*Order No. 61089*
The Clean Air Guide: How to Identify and Correct Indoor Air Problems in Your Home	*Order No. 61082*

Free Publications

About Your House *fact sheets*

Carbon Monoxide	*Order No. 62046*
Assessing the Comfort and Safety of your Home's Mechanical Systems	*Order No. 62266*
Wood Heat Safety in an Emergency	*Order No. 60339*
Hiring a Contractor	*Order No. 62277*

ADVANCED AND EVER ADVANCING MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC

DUCTLESS SPLIT-TYPE AIR CONDITIONERS

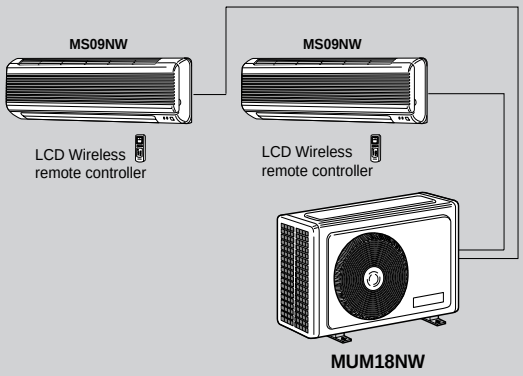
No.OB202

TECHNICAL & SERVICE MANUAL

Wireless type

Models

MS09NWX2 •MUM18NW



CONTENTS

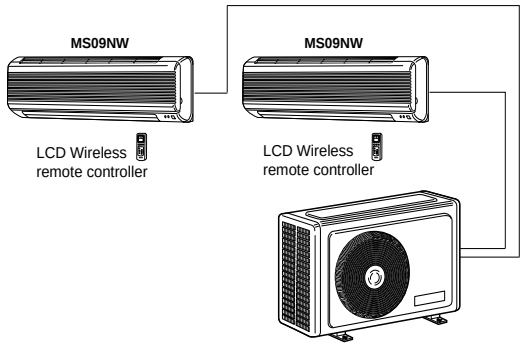
NOTE : For parts list, please refer to the following manuals.
MS09NW → OB192

The Slim Line.
From Mitsubishi Electric.

Mr.SLIM

1 FEATURES

This "2 to 1" Multi system consists of a single outdoor unit with two compressors that permit up to two indoor units to be installed separate rooms, each with its own controller.



Cooling Capacity (BTU/h)

Operation \ Indoor unit	MS09NW	MS09NW
1 Indoor Unit Operation	8,400	—
	—	8,400
2 Indoor Unit Operatin	8,400	8,400

1.SPACE-SAVING LAYOUT

Two indoor units are served by a single outdoor unit whose installation requires only minimum space. This allows equipment installed outside the house to be arranged in a neat, space-saving layout.

2.FLEXIBLE INSTALLATION OF INDOOR UNITS

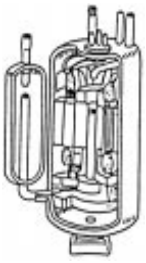
Each indoor unit can be connected to piping up to 49 feet in length, providing plenty of freedom in determining the best locations for installation.

3.AUTO-RESTART FUNCTION

The auto restart function restarts the equipment when power is restored following an outage automatically. Operation resumes in the mode in which the equipment was running immediately before the outage.

HIGH PERFORMANCE ROTARY COMPRESSOR

The advanced design of Mitsubishi Electric's powerful and energyefficient rotary compressor results in lower operating costs and longer service life.



2 TECHNICAL CHANGES

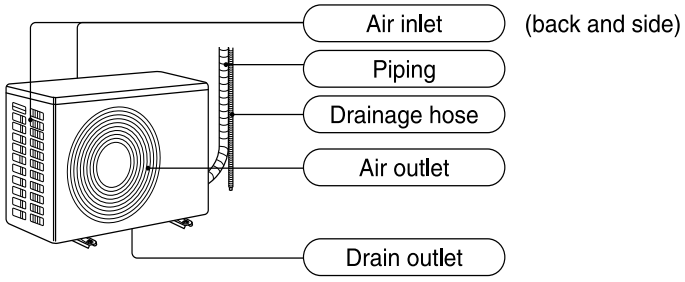
MSM18EW → MSM18NW

1. Indoor unit has been changed.
2. Outdoor unit has been changed.
3. Remove controller has been changed.
   (The timer function was changed to the clock timer function.)
4. Indoor auto vave has been adopted.
5. Outdoor fan motor has been changed.
   (SGW-60F-AC→RA6W60-AA)
6. The varistor and the fuse have been added to electric circuit of the outdoor unit.

3 PART NAMES AND FUNCTIONS

OUTDOOR UNIT

MUM18NW



4 SPECIFICATIONS

Items \ Model			MSM18NW	
			SINGLE	DOUBLE
Cooling capacity		※1 BTU/h	8,400	8,400X2
Power consumption		※1 W	850	1,700
EER (Double unit operation)			9.9	
SEER (Double unit operation)			10.0	
INDOOR UNIT MODEL			MS09NWX2	
Extenal finish			White	
Power Supply		V, Hz, Phase	115,60,1	
Max. fuse size (time delay)		A	15	
Min. ampacity			0.5	
Fan motor		F.L.A	0.37	
Airflow Lo-Me-Hi	Dry	CFM	208-265-328	
	Wet	CFM	177-226-279	
Moisture removal		(Pints/h)	–	
Cond. drain connection OD		in.	5/8	
Dimensions	W	in.	32-1/16	
	D	in.	7-3/16	
	H	in.	10-13/16	
Weight		lbs.	18	
OUTDOOR UNIT MODEL			MUM18NW	
External fnish			Munsell 5Y6.5/1	
Power supply		V, Hz, Phase	208/230,60,1	
Max. fuse sizu (time delay)		A	15X2	
Min. ampacity			14	14+13
Fan motor		F.L.A	1.0	
Compressor	Model		KH122WESX2	
	Winding resistance (at 68˚F) Ω		C-R 0.98 C-S 2.21	
		R.L.A	10X2	
		L.R.A	37X2	
Refrigerant control			Capillary tube	
Dimensions	W	in.	33-1/2	
	D	in.	11-7/16 (12-5/8)	
	H	in.	23-7/8	
Weight		lbs.	122	
REMOTE CONTROLLER			Wireless type	
Control voltage (be built-in transformer)			12V DC	
REFRIGERANT PIPING			Not supplied (optional parts)	
Pipe size	Liquid	in.	1/4	
	Gas	in.	3/8	
Connection method	Indoors		Flared	
	Outdoors		Flared	
Between the indoor & outdoor units	Height difference	ft	Max. 25	
	Piping length	ft	Max. 49	

Notes ※1. Rating conditions (cooling) — Inddor : 80˚FDB, 67˚FWB, Outdoor : 95˚FDB, 75˚FWB

Operating Range

		Indoor air intake temperature	Outdoor air intake temperature
Cooling	Maximum	90˚FDB,71˚FWB	115˚FDB
	Maximum	67˚FDB,57˚FWB	67˚FDB

5 DATA

1.PERFORMANCE DATE (ONE INDOOR UNIT WITH ONE OUTDOOR UNIT)

MS09NW×2
MUM18NW

Models	Indoor air IWB (°F)	Outdoor intake air DB temperature(°F)													
		75			85			95			105			115	
		TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
MS09NW	71	10.3	5.93	0.76	9.61	5.55	0.83	9.03	5.21	0.89	8.4	4.84	0.94	7.73	4.46	0.98
	67	9.74	6.91	0.71	9.07	6.44	0.79	8.4	5.95	0.85	7.81	5.55	0.90	7.18	5.10	0.94
	63	9.16	7.72	0.68	8.48	7.16	0.75	7.9	6.66	0.81	7.18	6.06	0.87	6.55	5.53	0.90

Notes 1. IWB : Intake air wet-bulb temperature
TC : Total Capacity (x10³ Btu/h), SHC : Sensible Heat Capacity (x10³ Btu/h)
TPC : Total Power Consumption (kW)
2. SHC is based on 80°F of indoor intake air DB temperature.

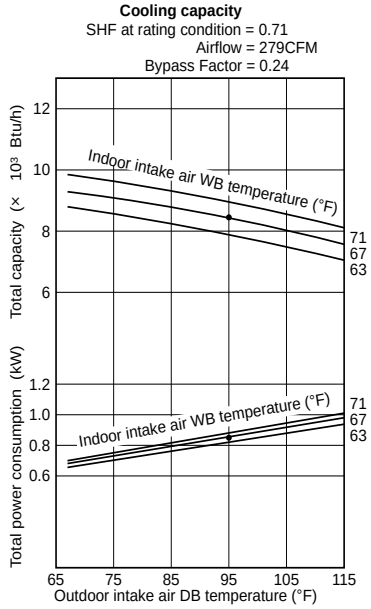
2) COOLING CAPACITY CORRECTIONS

MODEL	Refrigerant piping length (one way)		
	25ft (std)	40ft	49ft
MS-09NW	1.0	0.954	0.927

1.PERFORMANCE CURVE (ONE INDOOR UNIT WITH ONE OUTDOOR UNIT)

NOTE : Apoint on the curve shows the reference point.

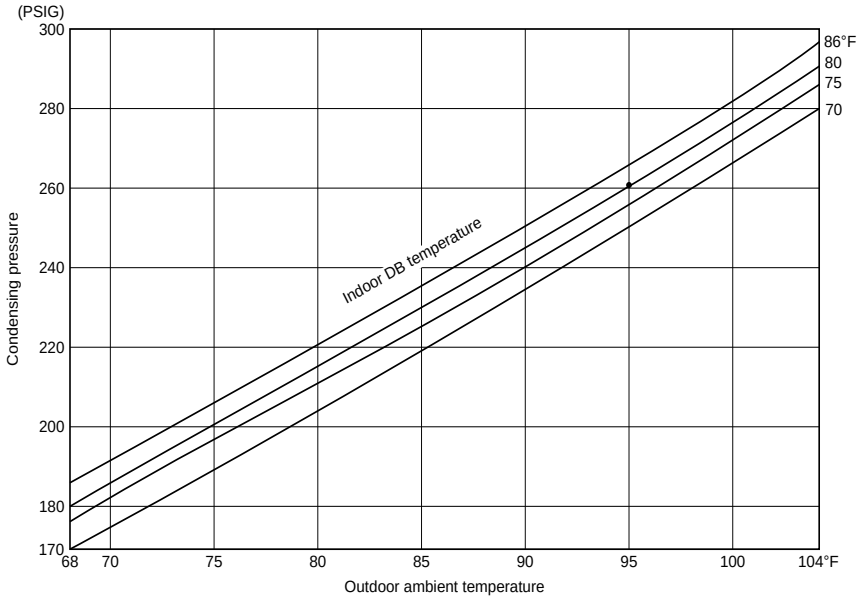
MS09NW
MUM18NW

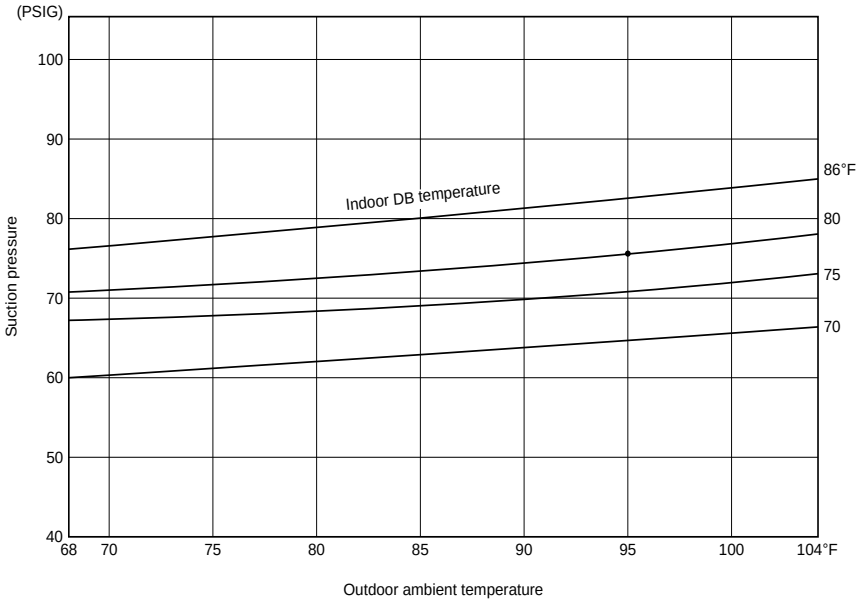


3.CONDENSING PRESSURE AND SUCTION PRESURE (ONE INDOOR UNIT WITH ONE OUTDOOR UNIT)

Data is based on the condition of indoor humidity 50%. Air flow should be set at HI. A point on the corve shows the reference point.

MS09NW
MUM18NW



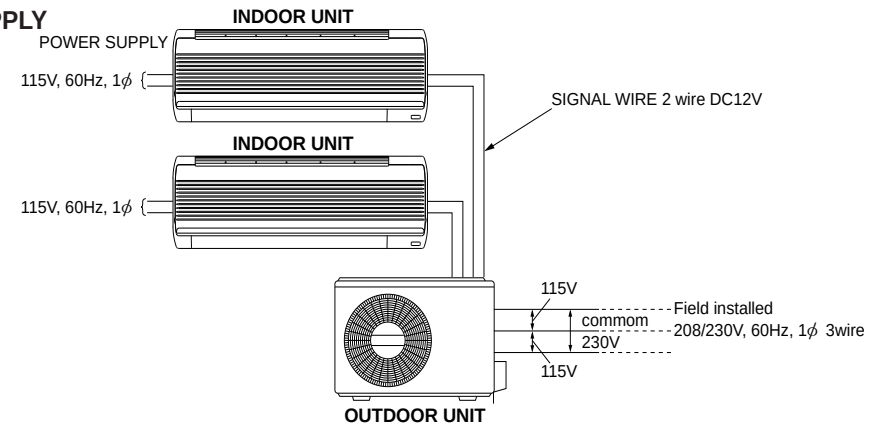


6

2.STANDARD OPERATION DATA

Model				MSM18NW	
				Single	Double
Item			Unit	Cooling	
Total	Capacity		Btu/h	8,400	8,400X2
	SHF		—	0.71	0.71
	Input		kW	0.85	1.70
Electrical circuit	Indoor unit model			MS09NW	
	Power supply (V,Hz,φ)			115·60·1	
	Input		kW	0.035X2	
	Fan current		A	0.34X2	
	Outdoor unit model			MUM18NW	
	Power supply (V,Hz,φ)			208/230·60·1(3-wire)	
	Input		kW	0.815	1.63
	Comp. current		A	6.64	7.16X2
	Fan current		A	1.0	
Refrigerant circuit	Condensing pressure		psi·G	260	270
	Suction pressure		psi·G	75	75
	Discharge temperature		˚F	194	191
	Condensing temperature		˚F	116	118
	Suction temperature		˚F	64	54
	Comp. shell bottom temp.		˚F	172	
	Ref. pipe length		ft	25X2	
	Refrigerant charge		—	1lds 14ozX2	
Indoor side	Intake air temperature	DB	˚F	80	
		WB	˚F	67	
	Discharge air temperature	DB	˚F	60	60
		WB	˚F	57	57
	Fan speed		rpm	1,230	
	Airflow (Hi)		CFM	279	
Outdoor side	Intake air temperature	DB	˚F	95	
		WB	˚F	—	
	Fan speed		rpm	900	
	Airflow		CFM	1,150	

3.POWER SUPPLY
MSM18NW



7

4.OPERATING RANGE

(1)POWER SUPPLY

	Models	Rating	Guaranteed Voltage
Indoor unit	MS09NW	115V 60Hz 1ϕ	Min. 103v—Max. 127V
Outdoor unit	MUM18NW	208/230V 60Hz 1ϕ (3wires)	Min. 198V 208V 230V Max. 253V

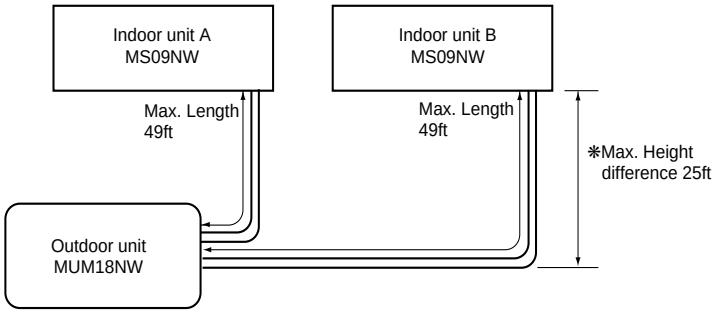
(2)OPERATION

Function	Intake air temperature / Condition	Indoor		Outdoor	
		DB (˚F)	WB (˚F)	DB (˚F)	WB (˚F)
Cooling	Standard temperature	80	67	95	–
	Maximum temperature	95	71	115	–
	Minimum temperature	67	57	67	–
	Maximum humidity	78%		–	

5.ADDITIONAL REFRIGERANT CHARGE (R-22(oz))

Model	Outdoor unit precharged (up to 25ft)	Refrigerant piping length (one way)					
		25ft	30ft	33ft	40ft	45ft	49ft
MS09NW×2 MUM18NW	1 lbs 14 oz ×2	0	1	1	2	2	3

6.MAX. REFRIGERANT PIPING LENGTH & MAX. HEIGHT DIFFERENCE MSM18NW



7.PIPING PREPARATION

① Table below shows the specifications of pipes commercially available.

UNIT No.	Pipe	Outside diameter inch	Insulation thickness(in)	Insulation material
A and B UNIT	For liquid	1/4	1/4	Heat resisting foam plastic 0.045 specific gravity
	For gas	3/8	1/4	

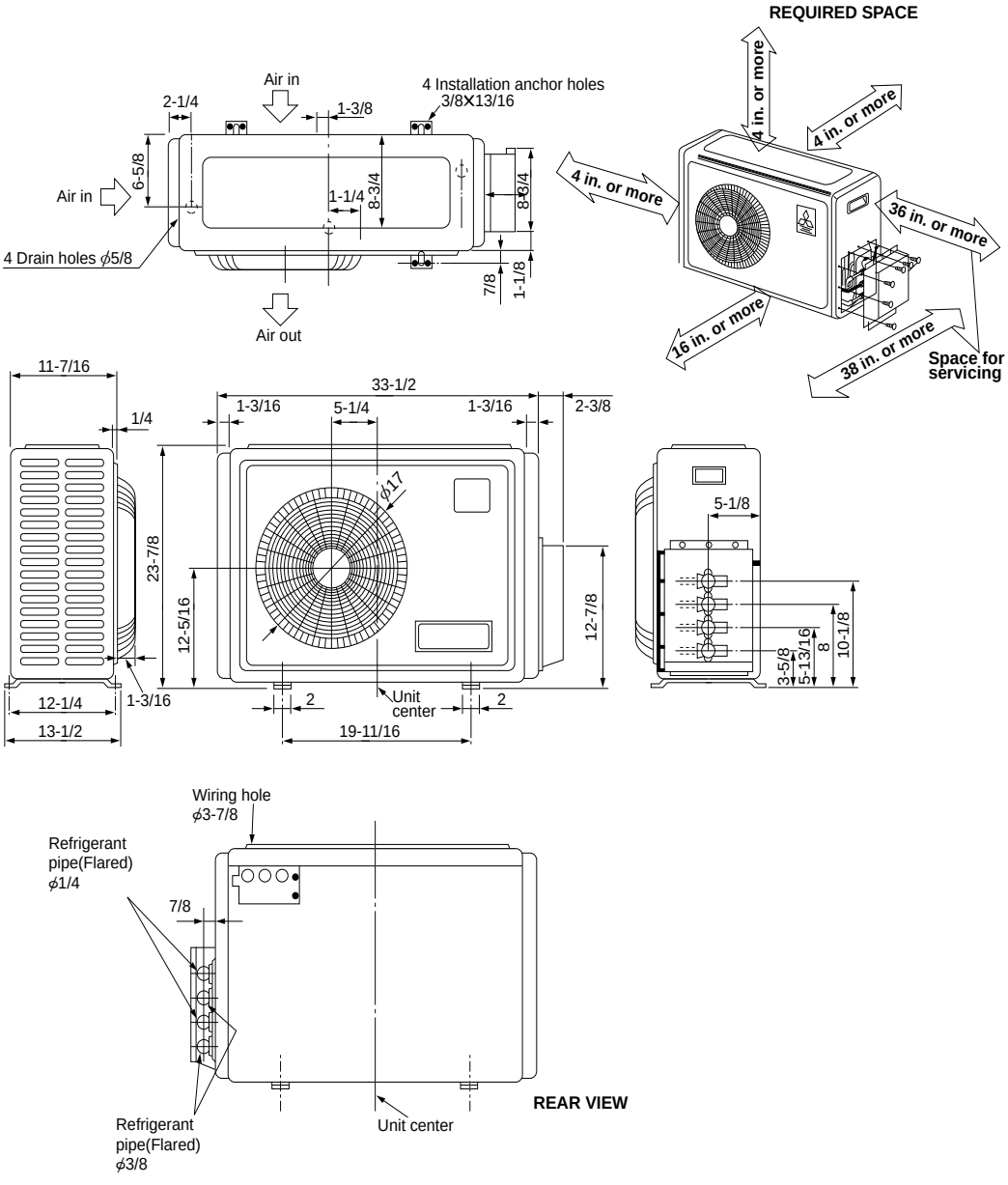
② Ensure that the 2 refrigerant pipes are well insulated to prevent condensation.
③ Refrigerant bending radius must be 10cm or more.

8

6 OUTLINES AND DIMENSIONS

MODEL : MUM18NW
OUTDOOR UNIT

Unit : inch

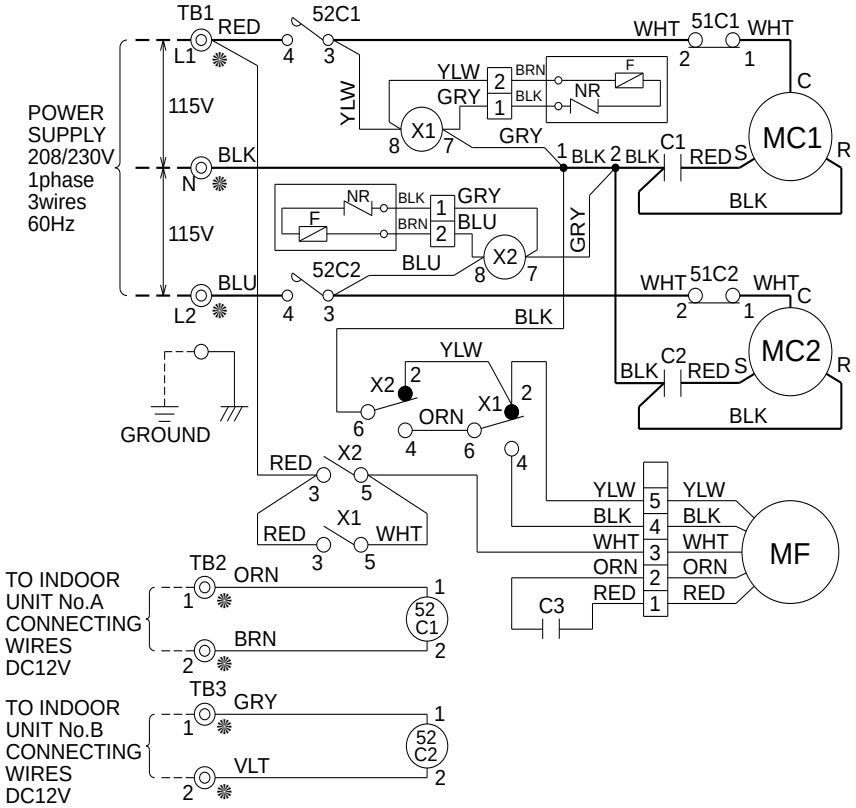


NOTE : The symbol ϕ indicates diameter.

7 WIRING DIAGRAM

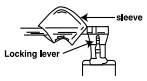
OUTDOOR

MODEL MUM18NW WIRING DIAGRAM



SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
C1,2	COMPRESSOR CAPACITOR	MF	FAN MOTOR(INNER THERMOSTAT)	51C1,2	OVERCURRENT RELAY
C3	FAN MOTOR CAPACITOR	NR	VARISTOR	52C1,2	COMPRESSOR CONTACTOR
F	FUSE(3.0A)	TB1~3	TERMINAL BLOCK		
MC1,2	COMPRESSOR	X1,2	FAN MOTOR RELAY		

NOTE: 1. Use copper conductors only (For field wiring).
2. Symbols below indicate.
⊙: Terminal block, □□□□: Connector
3. "❋"shows the terminals with a lock mechanism, so they cannot be removed when you pull the lead wire.
Be sure to pull the wire by pushing the locking lever (projected part) of the terminal with a finger.

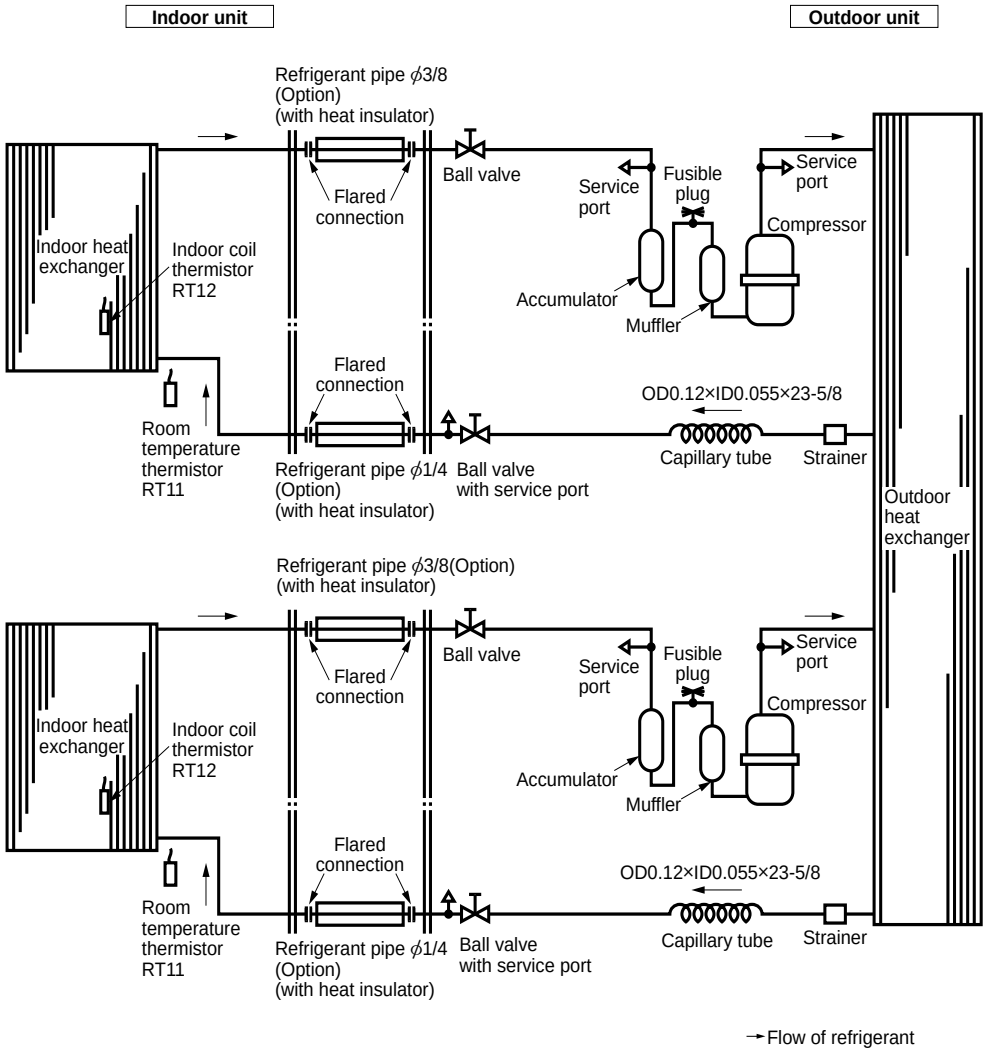


1.Slide the sleeve.
2.Pull the wire while pushing the locking lever.

8 REFRIGERANT SYSTEM DIAGRAM

MS09NW×2/MUM18NW

Unit : inch



9 TROUBLESHOOTING

MUM18NW

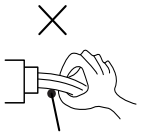
9-1 Cautions on troubleshooting

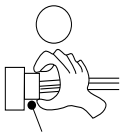
9-1-1 Before troubleshooting, check the followings:

1) Check the power supply voltage.
2) Check the indoor/outdoor connecting wire for mis-wiring.

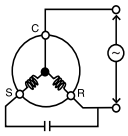
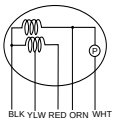
9-1-2 Take care the followings during servicing.

1) Befor servicing the air conditioner, be sure to first turn off the remote controller to stop the main unit, and then after confirming the horizontal vane is closed, disconnect the breaker.
2) When removing the P.C. board, hold the edge of the board with care NOT to apply stress on the components.
3) When connecting or disconnecting the connectors, hold the housing of the connector. DO NOT pull the lead wires.


Lead wiring


Housing point

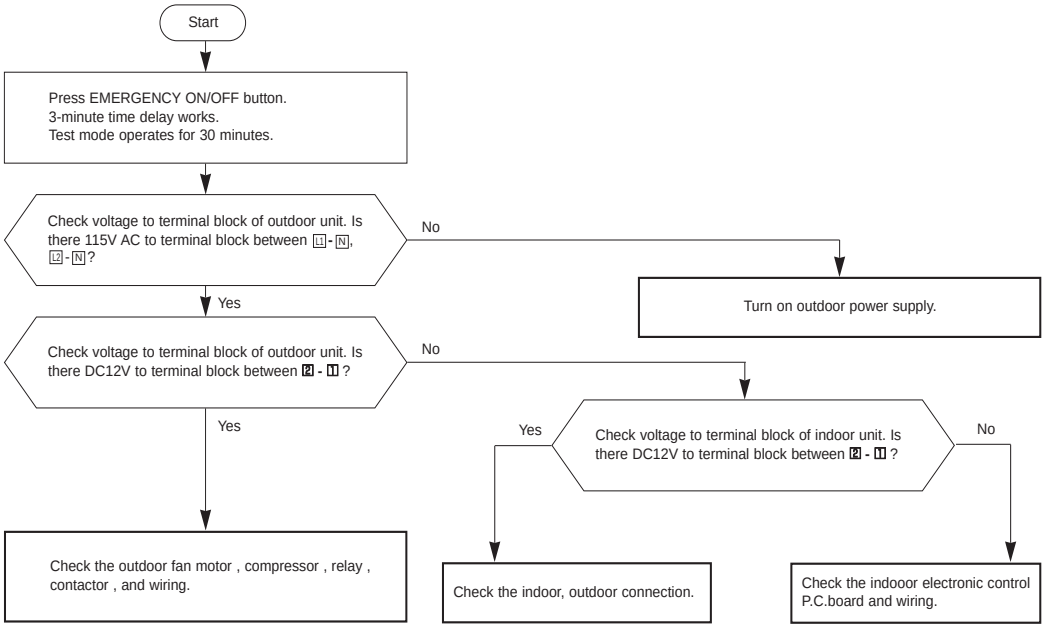
9-2 Trouble criterion of main parts

<table>
<tr><th>Part name</th><th>Check method and criterion</th><th>Figure</th></tr>
<tr><td>Compressor</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature-10°C ~ 40°C)
<table>
<tr><th></th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>C-R</td><td>0.86~1.06Ω</td><td rowspan="2">Opened or short-circuited</td></tr>
<tr><td>C-S</td><td>1.94~2.39Ω</td></tr>
</table></td><td> 
</td></tr>
<tr><td>Outdoor fan motor</td><td>Measure the resistance between the terminals with a tester.
(Coil wiring temperature-10°C ~ 40°C)
<table>
<tr><th></th><th>Normal</th><th>Abnormal</th></tr>
<tr><td>WHT-BLK</td><td>17.6~21.6Ω</td><td rowspan="3">Opened or short-circuited</td></tr>
<tr><td>BLK-YLW</td><td>9.1~11.3Ω</td></tr>
<tr><td>YLW-RED</td><td>9.1~11.3Ω</td></tr>
</table></td><td> 
</td></tr>
</table>

12

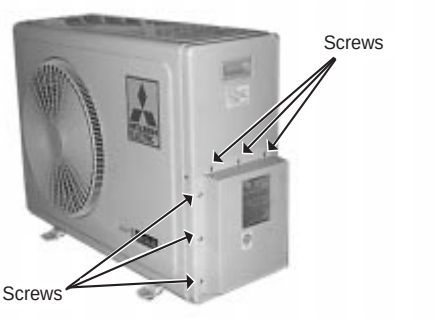
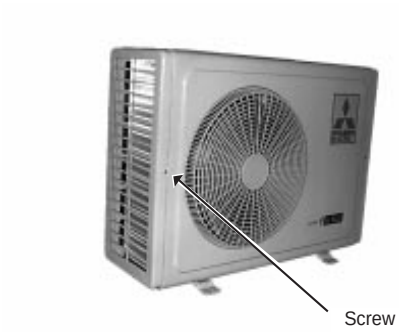
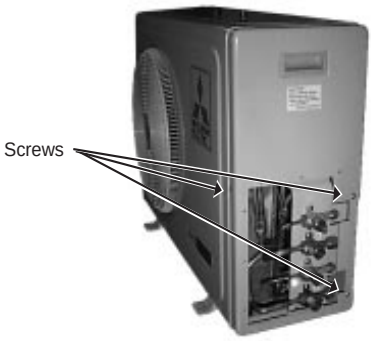
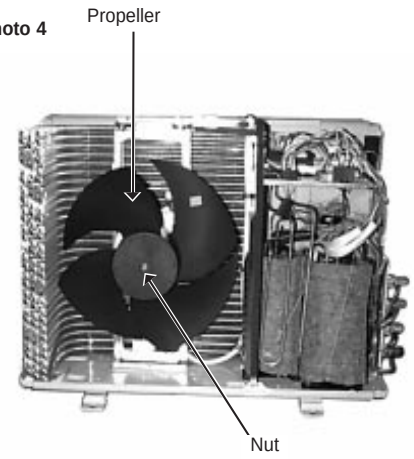
Check of outdoor unit

Compressor and outdoor fan do not operate.(Only indoor fan operates.)

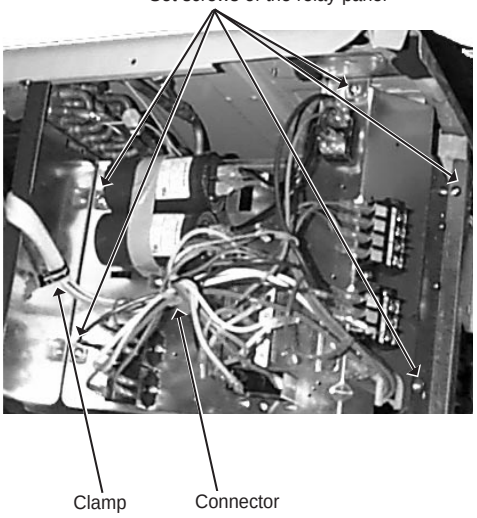
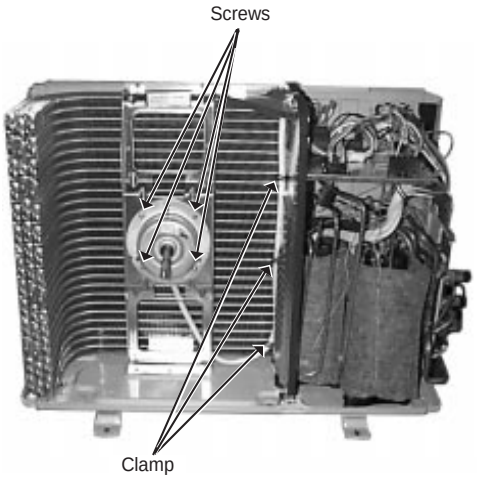


10 DISASSEMBLY INSTRUCTIONS

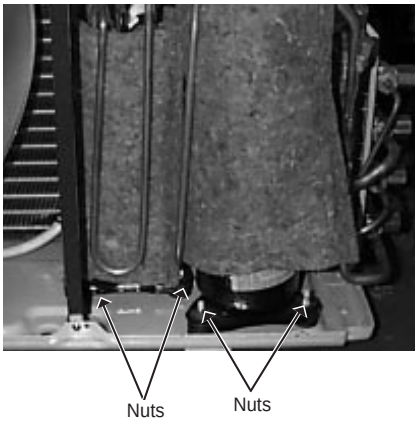
OUTDOOR UNIT MUM18NW

OPERATING PROCEDURE	PHOTOS
1. Removing of the cabinet (1)Remove the set screws of the valve cover to remove the valve cover as shown in Photo 2. (2)Remove the set screws of the side panel to remove the side panel and cabinet.	**Photo 1** 
Photo 3 	**Photo 2** 
2. Removing the propeller (1)Remove the propeller nut. (2)Loosen the propeller in the rotating direction. (3)Pull the propeller forward. **Note:** ● To set the propeller, fit the cut on the shaft to the mark on the propeller.	**Photo 4** 

14

OPERATING PROCEDURE	PHOTOS
3. Removing the outdoor fan motor. (1) Remove the cabinet. (Refer to 1) (2) Remove the propeller. (Refer to 2) (3) Disconnect the connector remove the clamp of out-door fan motor lead wire. (4) Remove the screws fixing the outdoor fan motor.	**Photo 5**  **Photo 6** 

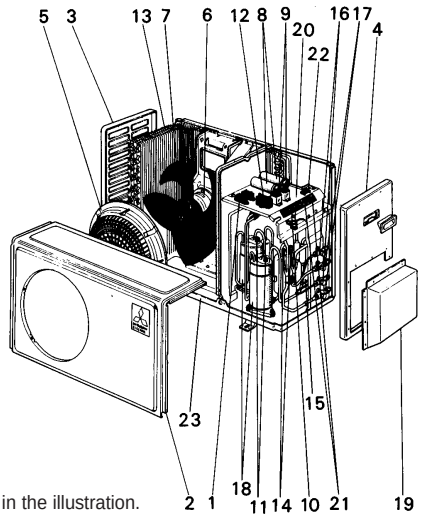
15

OPERATING PROCEDURE	PHOTOS
4. Removing the compressor (1)Disconnect the cord connector. (See Phot 5) (2)Remove the set screws of the relay panel. (3)Remove the set nuts of the terminal cover. (4)Pull up the compressor. (5)Pull out the lead wires from the compressor terminal to remove overcurrent relay. (6)Remove set nuts of the compressor base. (7)Remove the low pressure side welded part and high pressure side welded part using a burner. **Note:** ● Before using a welder, release gas inside the unit and make sure that the gauge pressure shows 0 kg/㎠. ● During welding, open the charge plug because pressure rises due to expansion by heat	**Photo 7** Set nuts of the terminal cover  **Photo 8**  Nuts Nuts

11 PARTS LIST

OUTDOOR UNIT PARTS
MUM18NW

Refer to MS09EW for indoor unit.



Part number that are circled is not shown in the illustration.

No.	Parts No.	Parts Name	Symbol in Wiring Diagram	Q'ty/unit MUM18NW	Remarks
1	T2W 382 342	CONTACTOR	52C1,52C2	2	G4F11123T-M
2	T2W 462 232	CABINET		1	
3	T2W 667 249	SIDE PANEL		1	
4	T2W 739 245	SERVICE PANEL		1	
5	T2W 466 509	OUTDOOR NOZZLE		1	
6	T2W A75 301	OUTDOOR FAN MOTOR	MF	1	RA6W60-□□
7	R01 093 115	PROPELLER		1	
8	T2W 903 353	COMPRESSOR CAPACITOR	C1,C2	2	55μF 220V
9	T2W 466 342	OUTDOOR FAN RELAY	X1,X2	2	
10	T2W E47 378	OUTDOOR TERMINAL BLOCK	TB1	1	
11	T2W 464 340	OVERCURRENT RELAY	51C1,51C2	2	
12	T2W 466 350	OUTDOOR FAN CAPACITOR	C3	1	8μF 220V
13	T2W 466 630	OUTDOOR HEAT EXCHANGER		1	
14	M21 B90 641	CHARGE PLUG		2	
15	T2W 416 642	FUSIBLE PLUG		2	
16	T2W 460 662	VALVE (LIQUID) 1/4		1	
17	T2W 460 661	VALVE (GAS) 3/8		1	
18	T92 513 200	COMPRESSOR	MC1,MC2	1	8μF 220V
19	T2W 739 246	VALVE COVER		1	
20	M21 B93 936	CAPILLARY TUBE		2	Ω0.12XΩ0.055X43-5/16
21	T2W E42 375	TERMINAL BLOCK	TB2,3	1	
22	M21 020 378	TERMINAL BLOCK		1	
23	T2W 739 290	BASE ASSEMBLY		1	
㉔	T2W A96 641	CHARGE PLUG		2	

When servicing, cut the tube to the proper length as shown in the REFRIGERANT SYSTEM DIAGRAM see page 11.

17

12 OPTIONAL PARTS

1. REFRIGERANT PIPES

The air conditioner has flared connections its indoor and outdoor sides.
Please use the optional extension pipe as follows.

Model	Part No.	Pipe length	Pipe size O.D				Additional refrigerant charge R-22(Oz)
			Cross-section	A-Gas	B-Liquid	Insulation	
MS09NW	MAC - 440PI	10ft		3/8	1/4	C 13/16 D 1-1/16	0
	MAC - 441PI	16ft					
	MAC - 442PI	23ft					
	MAC - 443PI	33ft					1

MITSUBISHI ELECTRIC CORPORATION

New publication, effective Sep. 1997.
Specifications subject to change without notice.

MITSUBISHI ELECTRIC

HVAC Advanced Products Division

3400 Lawrenceville Suwanee Road • Suwanee, Georgia 30024
Toll Free: 800-433-4822 • Toll Free Fax: 800-889-9904
www.mrslim.com

Specifications are subject to change without notice.

The links below connect you to a series of documents that will help you understand your home and how it works. These are in addition to links attached to specific items in the report.

Click on any link to read about that system.