

SERVICE MANUAL

FI06.8 / FI06.8A / FI56.8 / FI56.8A
Motor Grader

Part number 47829043

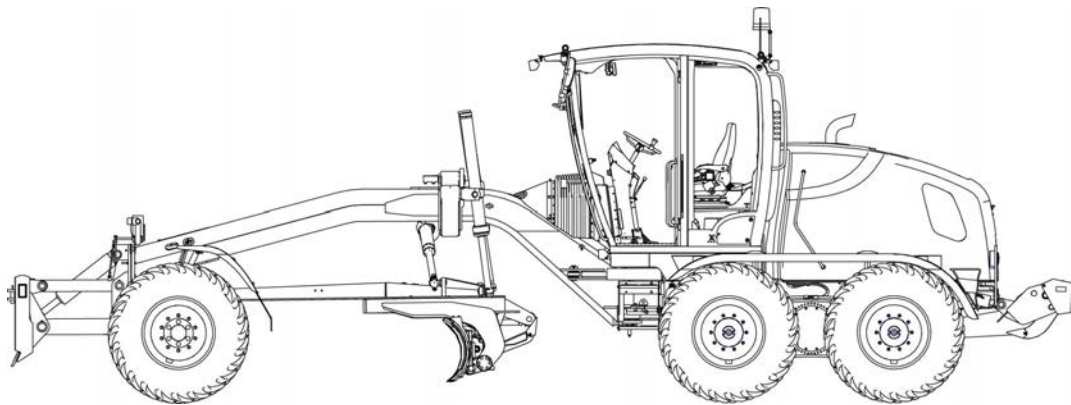
English

January 2015





SERVICE MANUAL



F106.8A

F106.8

F156.8A

F156.8

Link Product / Engine

Product	Market Product	Engine
F106.8	Europe	F4HFE613Y*B003
F106.8A	Europe	F4HFE613Y*B003
F156.8	Europe	F4HFE613Y*B003
F156.8A	Europe	F4HFE613Y*B003

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INTRODUCTION

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Foreword - Important notice regarding equipment servicing

F106.8A	WE
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F156.8	WE

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your NEW HOLLAND CONSTRUCTION Sales and Service Networks.

Safety rules

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Personal safety

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Carefully read this Manual before proceeding with maintenance, repairs, refuelling or other machine operations.

Repairs have to be carried out only by authorized and instructed staff; specific precautions have to be taken when grinding, welding or when using mallets or heavy hammers.

Not authorized persons are not allowed to repair or carry out maintenance on this machine. Do not carry out any work on the equipment without prior authorization.

Ask your employer about the safety instructions in force and safety equipment.

Nobody should be allowed in the cab during machine maintenance unless he is a qualified operator helping with the maintenance work.

If it is necessary to move the equipment to carry out repairs or maintenance, do not lift or lower the equipment from any other position than the operator's seat.

Never carry out any operation on the machine when the engine is running, except when specifically indicated.

Stop the engine and ensure that all pressure is relieved from hydraulic circuits before removing caps, covers, valves, etc.

All repair and maintenance operations should be carried out with the greatest care and attention.

Service stairs and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.

Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

⚠ DANGER

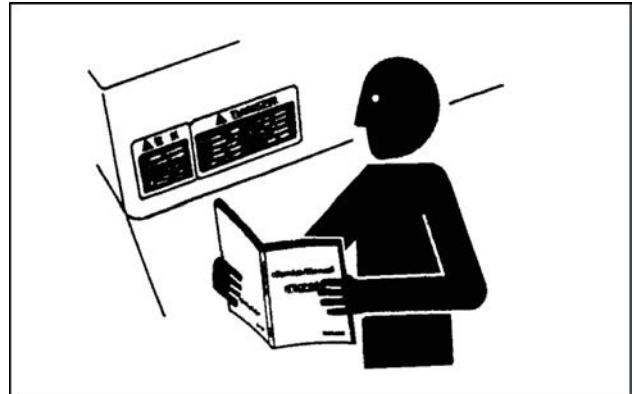
Unexpected movement!

Make sure parking brake is applied. Secure machine with wheel chocks.

Failure to comply will result in death or serious injury.

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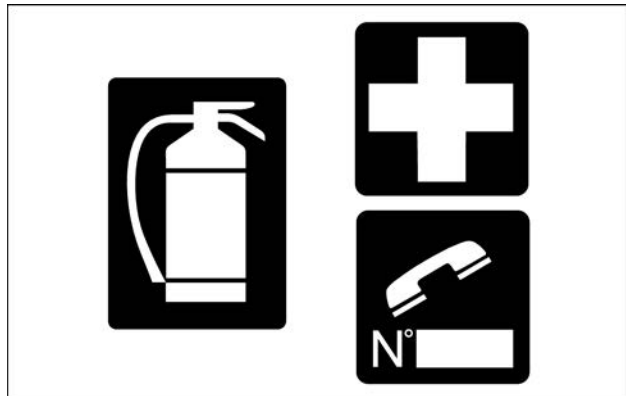
Before performing any work on the machine, attach a maintenance in progress tag. This tag can be applied on the dashboard, on the cab door, or at any other well visible place.



TULI12WEX2004AA 1

Emergency

Be prepared for emergencies. Always keep a fire extinguisher and first aid kit readily available. Ensure that the fire extinguisher is serviced in accordance with the manufacturer's instructions.



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Equipment

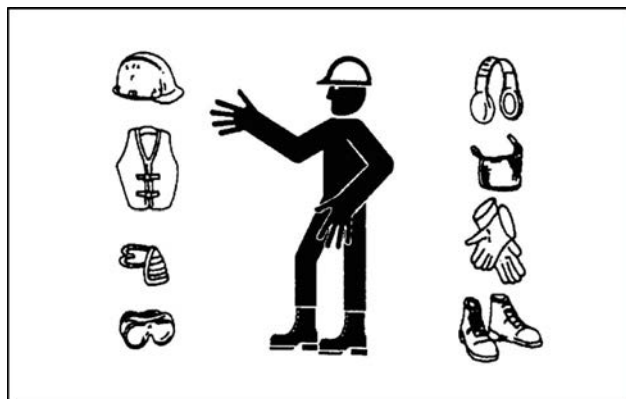
Wear close fitting clothing and safety equipment appropriate for the job:

- Safety helmet
- Safety shoes
- Heavy gloves
- Reflective clothing
- Wet weather clothing

If working conditions require, the following personal safety equipment should be on hand:

- Respirators (or dust proof masks)
- Ear plugs or acoustic ears protections
- Goggles with lateral shield or masks for eyes protection

Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get caught into moving parts.



TUL12WEX2008AA 3

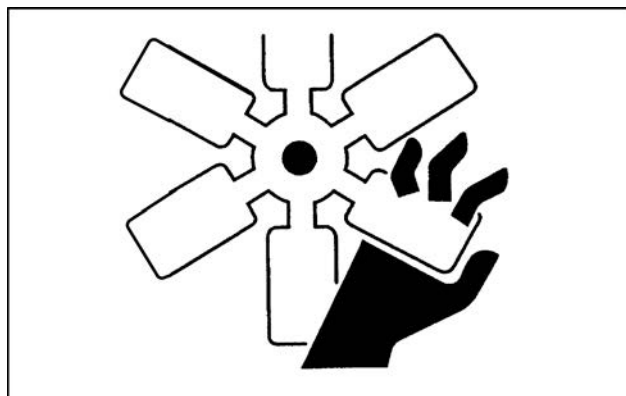
Engine - Radiator

Never leave the engine running in enclosed spaces without proper ventilation which is able to evacuate toxic exhaust gases. Keep the exhaust manifold and tube free from combustible materials.

Do not refuel with the engine running, especially if hot, as this increases fire hazard in case of fuel spillage.

Never attempt to check or adjust the belts when the engine is running.

Never lubricate the machine with the engine running.



TUL12WEX2009AA 4

Pay attention to rotating components and do not allow to anyone to approach these areas to avoid becoming entangled.

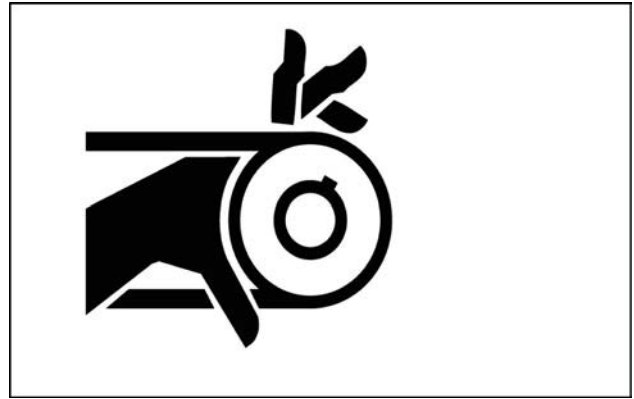
Hands, clothing or tools getting caught in the fan blades or transmission belts, can cause amputations, violent hemorrhages and generate conditions of grave danger. For this reason avoid touching or approaching all rotating or moving parts.

A surging spray of the coolant from the radiator can cause serious burns and scalds.

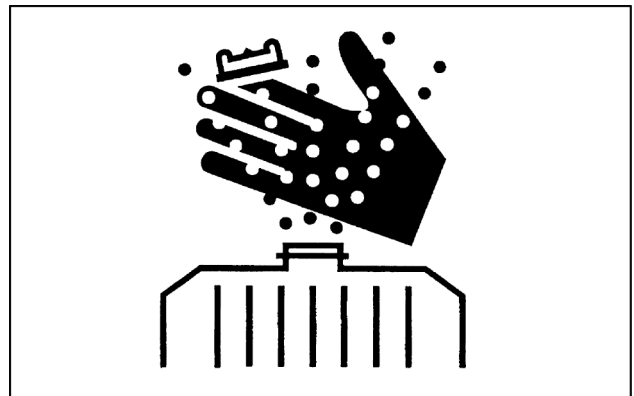
Before checking the coolant level, shut-off the engine and allow machine to cool down the radiator and hoses. Slowly unscrew the cap to release any residual pressure.

If it is necessary to remove the cap while engine is hot, wear safety clothes and equipment, then loosen the cap slowly to relieve the pressure gradually.

When checking the fuel, oil and coolant levels, use lights and lamps explicitly designated as explosion proof. If these types of lamps are not use, fires or explosions may occur.



TULI12WEX2010AA 5



TULI12WEX2011AA 6

Hydraulic systems

Jets of fluids under pressure can penetrate the skin causing serious injuries.

Avoid this hazard by relieving pressure before disconnecting hydraulic or other lines.

Relieve the residual pressure by moving the hydraulic control levers several times.

Tighten all connections before applying pressure.

To protect the eyes wear a facial shield or safety goggles.

Protect your hands and body from possible jets of fluids under pressure.

Swallowing hydraulic oil is a severe health hazard.



TULI12WEX2012AA 7

When hydraulic oil has been swallowed, avoid vomiting, but consult a doctor or go to a hospital.

If an accident occurs, see a doctor familiar with this type of injury immediately.

Any fluid penetrating the skin must be removed within few hours to avoid serious infections.

Flammable splashes may originate because of heating near lines with fluids under pressure, resulting in serious burns. Do not weld or use torches near lines containing fluids or other flammable materials.

Lines under pressure can accidentally be pierced when the heat expands beyond the area immediately heated.

Arrange for temporary fire resistant shields to protect hoses or other components during welding or torch use.

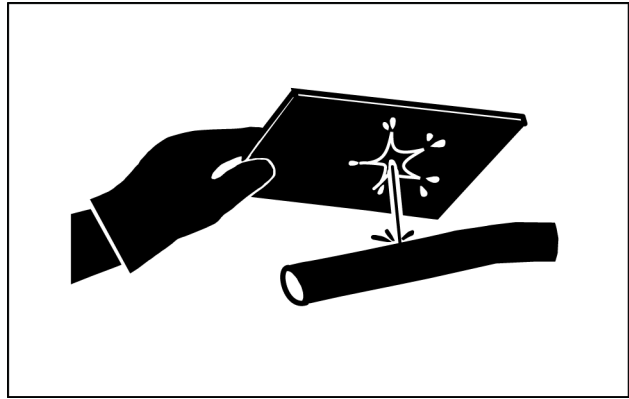
Have any visible leakage repaired immediately.

Discharged oil pollutes the environment. Soak up any oil that has spilled with a proper binding agent. Sweep up binding agent and dispose of it separately from other waste.

Never search for leakages with fingers; instead, use a piece of cardboard and always wear goggles.

Never repair a damaged line; always replace it. Replace hydraulic hoses immediately on detecting any damaged or moist areas.

Always store hydraulic oil in the original containers.



TULI12WEX2013AA 8

Hoses and tubes

Always replace hoses and tubes if the cone end or the end connections on the hose are damaged.

When installing a new hose, loosely connect each end and make sure the hose takes up the correct position before tightening the connections. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing.

After hose replacement to a moving component, check that the hose does not foul by moving the component through the complete range of travel. Be sure any hose which has been installed is not kinked or twisted.

Hose connections which are damaged, dented, crushed or leaking, restrict oil flow and the productivity of the components being served. Connectors which show signs of movement from the original position have failed and will ultimately separate completely.

A hose with a frayed outer sheath will allow water penetration. Concealed corrosion of the wire reinforcement could subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure soon occurs.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which can result in oil restriction, a reduction in the speed of operation and ultimate hose failure.

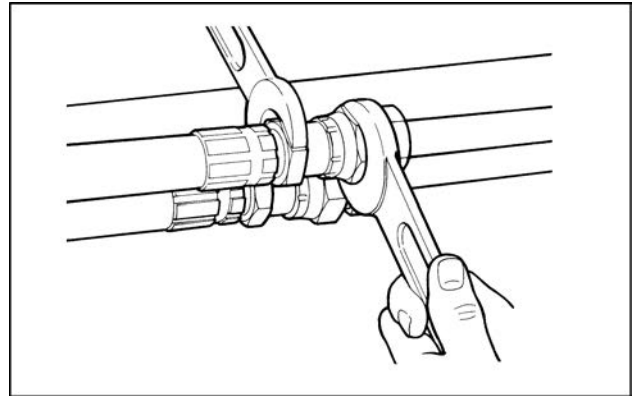
Free-moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.

O-rings

Replace O-rings, seal rings and gaskets whenever they are disassembled.

Never mix new and old seals or O-rings, regardless of condition. Always lubricate new seal rings and O-rings with hydraulic oil before installation to relevant seats.

This will prevent the O-rings from rolling over and twisting during mounting which will jeopardize sealing.



TULI12WEX2014AA 9

Battery

Batteries give off explosive gases.

Never handle naked flames and unshielded light sources near batteries. (No smoking is addressed in next instruction).

To prevent any risk of explosion, observe the following instructions:

- When disconnecting the battery cables, always disconnect the negative (-) cable first.
- To reconnect the battery cables, always connect the negative (-) cable last.
- Never short-circuit the battery terminals with metal objects.
- Do not weld, grind or smoke near a battery.

Battery electrolyte causes severe burns. The battery contains sulphuric acid. Avoid any contact with the skin, eyes or clothing.

Antidote:

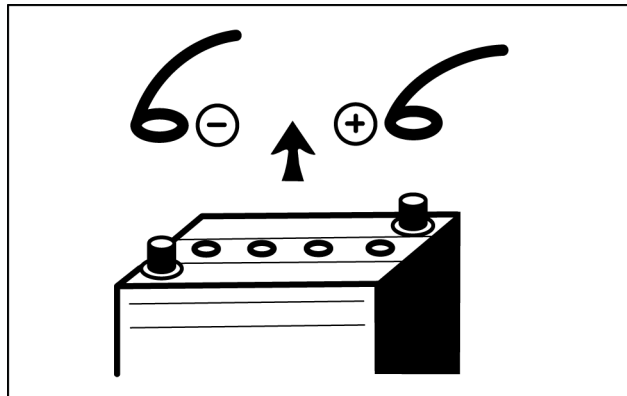
- **EXTERNAL:** Rinse well with water, removing any soiled clothing.
- **INTERNAL:** Avoid vomiting. Drink water to rinse your mouth. Consult a doctor.
- **EYES:** Rinse abundantly with water for **15 min** and consult a doctor.
- When the electrolyte of a battery is frozen, it can explode if you attempt to charge the battery or if you try to start the engine using a booster battery. Always keep the battery charged to prevent the electrolyte freezing.

Provide good ventilation when changing a battery or using a battery in an enclosed space. Always protect your eyes when working near a battery.

Never set tools down on the battery. They may induce a short circuit, causing irreparable damage to the battery and injuring persons.

Never wear metal necklaces, bracelets or watch straps when working on the battery. The metal parts may induce a short circuit resulting in burns.

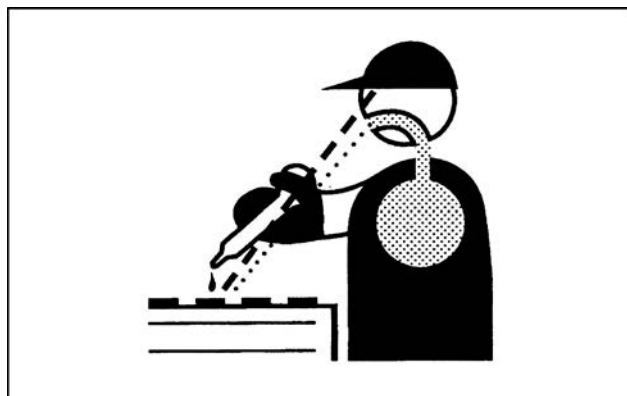
Dispose of used batteries separately from other waste in the interests of environmental protection.



TULI12WEX2015AA 10



TULI12WEX2016AA 11



TULI12WEX2017AA 12

Flammable liquids

When handling flammable liquids:

- Do not smoke.
- Keep away from unshielded light sources and naked flames.

Fuels often have a low flash point and are readily ignited.

Never attempt to extinguish burning liquids with water.
Use:

- Dry powder
- Carbon dioxide
- Foam

Water used for extinguishing purposes would vaporize instantaneously on contact with burning substances and spread burning oil, for example, over a wide area. Water generates short circuits in the electrical system, possibly producing new hazards.

Stay away from open flames during refilling of hydraulic oil or fuel.

Fuel or oil spills can cause slipping hazards; thoroughly contain and clean affected areas.

Always tighten the safety plugs of fuel tank and hydraulic oil tank firmly.

Never use fuel to clean machine parts that will be exposed to dirt or debris.

Use a non-flammable product for cleaning parts.

Always perform fuel or oil refilling in well aired and ventilated areas.

During refuelling hold the pistol firmly and always keep it in contact with the filler neck until the end of the refuelling, to avoid arcing due to static electricity.

Do not overfill the tank but leave a space for fuel expansion.

Never refuel when the engine is running.

Take all the necessary safety measures when welding, grinding or when working near a naked flame.



TULI12WEX2016AA 13



TULI12WEX2018AA 14



TULI12WEX2019AA 15

Tires

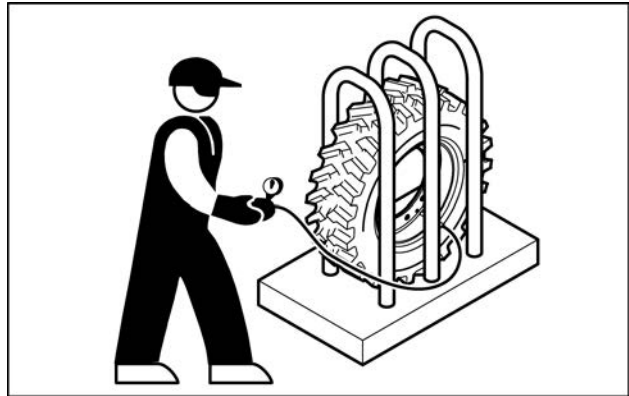
Before inflating the tires, always check the condition of rims and the outer condition of tires to find out the presence of dents, cuts, tears of reinforcement plies or other faults. Before inflating a tire, make sure that there are no nearby persons, then position yourself at tread side.

When inflating tires, ensure tire pressure does not exceed that prescribed by the tire manufacturer. Ensure that the pressure of the right tire corresponds to the pressure of the left tire.

NOTE: The front and rear tire pressures may be different.

Never use reconditioned rims because possible welds, heat treatments or brazings not performed correctly can weaken the wheels and cause following damages or failures. Deflate the tires before their disassembly.

Before taking out possible jammed objects from the rims, it is necessary to deflate the tires. Inflate tires by means of an inflation pistol complete with extension and pressure control valve.



TUL112WEX2020AA 16

Cleaning

Clean the exterior of all components before carrying out any form of repair. Dirt and dust can reduce the efficient working life of a component and lead to costly replacement.

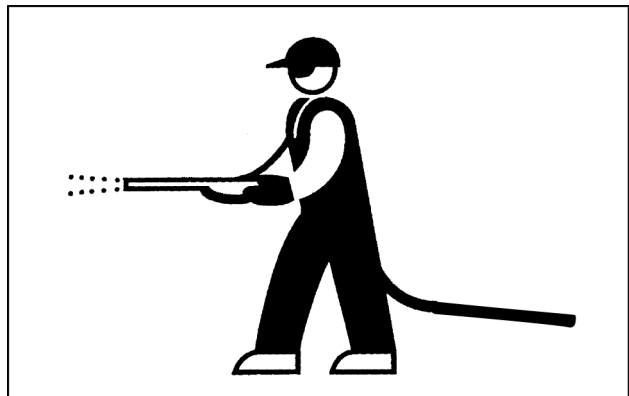
Solvents should be checked that they are suitable for the cleaning of components and also that they do not risk the personal safety of the user.

Dirt, oil, grease and scattered tools are dangerous for people, because they can create slipping or tripping hazards.

For machine cleaning, use a jet of warm water or steam under pressure and commercial detergents. Never use fuel, petroleum or solvents, because they can leave an oily residue that attracts dust, and solvents (even if weak) damage the paint and can lead to the information of rust.

Never use water jets or steam on sensors, connectors or other electric components.

Avoid direct spray of seals and seams to prevent water penetration inside the cab.



TUL112WEX2021AA 17

Waste disposal

Improperly disposing of waste can threaten the environment.

Each country has its own regulations on this subject. It is therefore advisable to prepare suitable containers to collect and store momentarily all solid and fluid materials that must not be scattered in the environment to avoid pollution.

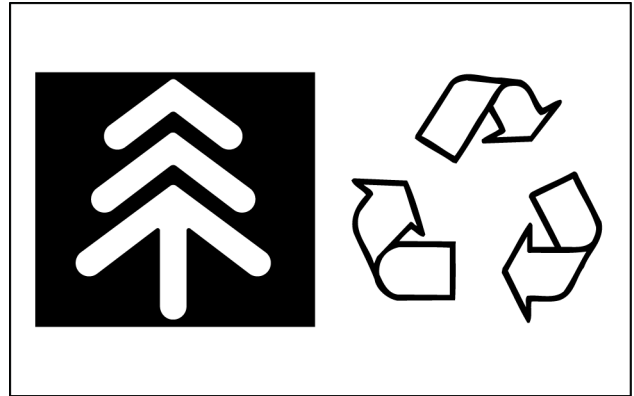
At preset intervals these products will be delivered to disposal stations legally recognized and present in this country.

Hereunder are listed some products of the machine requiring disposal:

- Lubricating oil
- Brake system oil
- Coolant mixture, condensation rests and pure antifreeze
- Fuel
- Filter elements, oil and fuel filters
- Filter elements, air filters
- Battery

Also polluting rags, paper, sawdust and gloves must be disposed in compliance with the same procedures.

Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service centre to recover and recycle used air conditioning refrigerants. Obtain information on the proper way to recycle or dispose of waste from your local environmental or recycling centre, or from your Dealer.



TULI12WEX2022AA 18

Torque – Minimum tightening torques for normal assembly

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Use the torques in this chart when special torques are not given. These torques apply to plain and zinc-dichromate fasteners as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphite lubricants, Molydisulfide greases, or other extreme pressure lubricants are used. A torque range of $\pm 10\%$ is acceptable.

Grade 8.8 bolts, nuts, and studs

Size	Nm	lb ft
4 mm	4 N·m	3 lb ft
5 mm	7 N·m	5 lb ft
6 mm	12 N·m	9 lb ft
8 mm	29 N·m	21 lb ft
10 mm	57 N·m	42 lb ft
12 mm	100 N·m	74 lb ft
14 mm	159 N·m	117 lb ft
16 mm	248 N·m	183 lb ft
18 mm	352 N·m	260 lb ft
20 mm	500 N·m	369 lb ft
22 mm	681 N·m	502 lb ft
24 mm	865 N·m	638 lb ft
27 mm	1262 N·m	931 lb ft
30 mm	1719 N·m	1268 lb ft
36 mm	2999 N·m	2212 lb ft

Markings for Grade 8.8 hardware



Grade 10.9 bolts, nuts and studs

Size	Nm	lb ft
4 mm	5 N·m	4 lb ft
5 mm	10 N·m	7 lb ft
6 mm	17 N·m	13 lb ft
8 mm	41 N·m	31 lb ft
10 mm	82 N·m	60 lb ft
12 mm	143 N·m	105 lb ft
14 mm	227 N·m	168 lb ft
16 mm	354 N·m	261 lb ft
18 mm	487 N·m	359 lb ft
20 mm	690 N·m	509 lb ft
22 mm	942 N·m	695 lb ft
24 mm	1195 N·m	882 lb ft
27 mm	1749 N·m	1290 lb ft
30 mm	2377 N·m	1753 lb ft
36 mm	4149 N·m	3061 lb ft

Markings for Grade 10.9 hardware



Grade 12.9 bolts, nuts, and studs

Torque values specified for grade 10.9 hardware can be used for grade 12.9 hardware.

Markings for Grade 12.9 hardware



Torque – Standard torque data for hydraulics

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Use the torques in the charts when special torques are not given.

The torque values are based on catalogue data provided by the hydraulic fitting manufacturers.

If the manufacturer is unknown apply the "Recommended" torque.

NOTE:

a) The torque values are applicable on all carbon steel components in which the external surface is protected with an appropriate coating (zinc plating). Changes in plating may affect assembly torques.

b) For steel fittings into aluminum or cast iron components the torque may differ (e.g. depending on depth of thread engagement)!

c) Not applicable if special graphite lubricants, Molydisulfide greases, or other extreme pressure lubricants are used.

The assembly of the fitting and connector shall be carried out without external loads. Screw up hand-tight and then tighten further with a spanner according to the values mentioned in the tables on the next pages. Ensure that in all cases the fitting or hose is correctly aligned before tightening onto the corresponding adaptor.

The fitting manufacturers which are not listed on the torque charts shall draw up assembly instructions for the use of the connectors. These instructions shall include at least the following:

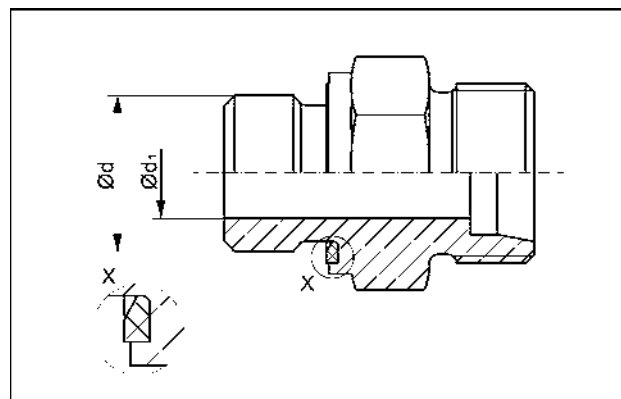
- Details relating to material and quality of suitable tubes
- Details concerning the preparation of the selected tube
- Instructions regarding the assembly of the connector, such as the number of wrenching turns or assembly torque
- Recommendations regarding the tools to be used for assembly

1. Stud connector for ports with elastomeric sealing (Type E)

NOTE:

- The torque chart give recommendations to threaded connectors in steel with a zinc-coated surface.

- For steel fittings into aluminum components the torque is **70 %** of the below values.



SS14G152 1

Stud end with elastomeric sealing (type E) according ISO 9974-2

Series	Tube outer diameter	Thread size (d)	Recommended	PARKER	VOSS
Light (L)	6 mm	M10 x 1	18 N·m (13 lb ft)	18 N·m (13 lb ft)	15 N·m (11 lb ft)
Light (L)	8 mm	M12 x 1.5	25 N·m (18 lb ft)	25 N·m (18 lb ft)	25 N·m (18 lb ft)
Light (L)	10 mm	M14 x 1.5	45 N·m (33 lb ft)	45 N·m (33 lb ft)	50 N·m (37 lb ft)
Light (L)	12 mm	M16 x 1.5	60 N·m (44 lb ft)	55 N·m (41 lb ft)	70 N·m (52 lb ft)
Light (L)	15 mm	M18 x 1.5	80 N·m (59 lb ft)	70 N·m (52 lb ft)	90 N·m (66 lb ft)
Light (L)	18 mm	M22 x 1.5	125 N·m (92 lb ft)	125 N·m (92 lb ft)	130 N·m (96 lb ft)
Light (L)	22 mm	M26 x 1.5	180 N·m (133 lb ft)	180 N·m (133 lb ft)	180 N·m (133 lb ft)
Light (L)	28 mm	M33 x 2	280 N·m (207 lb ft)	310 N·m (229 lb ft)	230 N·m (170 lb ft)
Light (L)	35 mm	M42 x 2	400 N·m (295 lb ft)	450 N·m (332 lb ft)	330 N·m (243 lb ft)
Light (L)	42 mm	M48 x 2	540 N·m (398 lb ft)	540 N·m (398 lb ft)	500 N·m (369 lb ft)

Stud end with elastomeric sealing (type E) according ISO 1179-2

Series	Tube outer diameter	Thread size (d)	Recommended	PARKER	VOSS
Light (L)	6 mm	G 1/8 A	18 N·m (13 lb ft)	18 N·m (13 lb ft)	20 N·m (15 lb ft)
Light (L)	8 mm	G 1/4 A	40 N·m (30 lb ft)	35 N·m (26 lb ft)	50 N·m (37 lb ft)
Light (L)	10 mm	G 1/4 A	40 N·m (30 lb ft)	35 N·m (26 lb ft)	50 N·m (37 lb ft)
Light (L)	12 mm	G 3/8 A	80 N·m (59 lb ft)	70 N·m (52 lb ft)	80 N·m (59 lb ft)
Light (L)	15 mm	G 1/2 A	100 N·m (74 lb ft)	90 N·m (66 lb ft)	100 N·m (74 lb ft)
Light (L)	18 mm	G 1/2 A	100 N·m (74 lb ft)	90 N·m (66 lb ft)	100 N·m (74 lb ft)
Light (L)	22 mm	G 3/4 A	180 N·m (133 lb ft)	180 N·m (133 lb ft)	180 N·m (133 lb ft)
Light (L)	28 mm	G 1 A	280 N·m (207 lb ft)	310 N·m (229 lb ft)	230 N·m (170 lb ft)
Light (L)	35 mm	G 1 1/4 A	400 N·m (295 lb ft)	450 N·m (332 lb ft)	330 N·m (243 lb ft)
Light (L)	42 mm	G 1 1/2 A	540 N·m (398 lb ft)	540 N·m (398 lb ft)	500 N·m (369 lb ft)

Stud end with elastomeric sealing (type E) according ISO 9974-2

Series	Tube outer diameter	Thread size (d)	Recommended	PARKER	VOSS
Heavy (S)	6 mm	M12 x 1.5	40 N·m (30 lb ft)	40 N·m (30 lb ft)	50 N·m (37 lb ft)
Heavy (S)	8 mm	M14 x 1.5	55 N·m (41 lb ft)	40 N·m (30 lb ft)	60 N·m (44 lb ft)
Heavy (S)	10 mm	M16 x 1.5	70 N·m (52 lb ft)	70 N·m (52 lb ft)	80 N·m (59 lb ft)
Heavy (S)	12 mm	M18 x 1.5	90 N·m (66 lb ft)	90 N·m (66 lb ft)	90 N·m (66 lb ft)
Heavy (S)	16 mm	M22 x 1.5	135 N·m (100 lb ft)	135 N·m (100 lb ft)	130 N·m (96 lb ft)
Heavy (S)	20 mm	M27 x 2	180 N·m (133 lb ft)	180 N·m (133 lb ft)	200 N·m (148 lb ft)
Heavy (S)	25 mm	M33 x 2	310 N·m (229 lb ft)	310 N·m (229 lb ft)	250 N·m (184 lb ft)
Heavy (S)	30 mm	M42 x 2	470 N·m (347 lb ft)	450 N·m (332 lb ft)	500 N·m (369 lb ft)
Heavy (S)	38 mm	M48 x 2	560 N·m (413 lb ft)	540 N·m (398 lb ft)	600 N·m (443 lb ft)

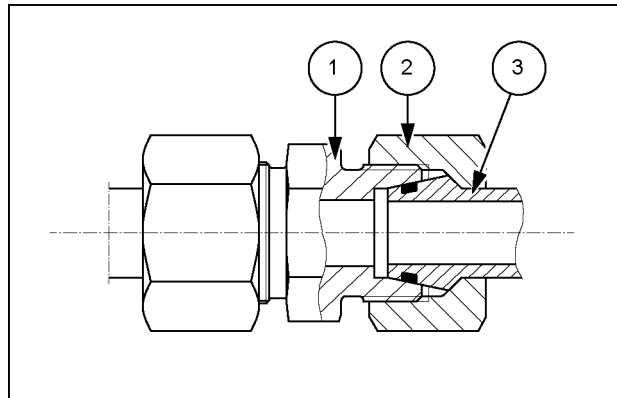
Stud end with elastomeric sealing (type E) according ISO 1179-2

Series	Tube outer diameter	Thread size (d)	Recommended	PARKER	VOSS
Heavy (S)	6 mm	G 1/4 A	50 N·m (37 lb ft)	40 N·m (30 lb ft)	60 N·m (44 lb ft)
Heavy (S)	8 mm	G 1/4 A	50 N·m (37 lb ft)	40 N·m (30 lb ft)	60 N·m (44 lb ft)
Heavy (S)	10 mm	G 3/8 A	80 N·m (59 lb ft)	80 N·m (59 lb ft)	90 N·m (66 lb ft)
Heavy (S)	12 mm	G 3/8 A	80 N·m (59 lb ft)	80 N·m (59 lb ft)	90 N·m (66 lb ft)
Heavy (S)	16 mm	G 1/2 A	120 N·m (89 lb ft)	115 N·m (85 lb ft)	150 N·m (111 lb ft)
Heavy (S)	20 mm	G 3/4 A	180 N·m (133 lb ft)	180 N·m (133 lb ft)	200 N·m (148 lb ft)
Heavy (S)	25 mm	G 1 A	300 N·m (221 lb ft)	310 N·m (229 lb ft)	250 N·m (184 lb ft)
Heavy (S)	30 mm	G 1 1/4 A	470 N·m (347 lb ft)	450 N·m (332 lb ft)	500 N·m (369 lb ft)
Heavy (S)	38 mm	G 1 1/2 A	560 N·m (413 lb ft)	540 N·m (398 lb ft)	600 N·m (443 lb ft)

2. 24° cone connectors (DKO) - Metallic tube connections conforming to ISO 8434-1

Assembly:

- Check that the O-ring is not twisted and that is bedded correctly in the groove of the taper.
- Lubricate the O-ring lightly with system fluid or compatible lubricant.
- Keeping the taper aligned, insert it into the cone and press it firmly.
- Turn the union nut until it is hand-tight.
- Then use a spanner to finally tighten up the coupling to the specified torque.



SS14G151 2

Position	Designation
1	Body
2	Nut
3	DKO-end (including O-ring)

24° cone connectors (DKO) - Metallic tube connections conforming to ISO 8434-1

Series	Tube outer diameter	Thread size	Recommended	ALFAGOMMA	FOR	PARKER	VOSS
Light (L)	6 mm	M12 x 1.5	15 - 17 N·m (11 - 13 lb ft)	15 - 20 N·m (11 - 15 lb ft)	13 - 15 N·m (10 - 11 lb ft)	15 - 17 N·m (11 - 13 lb ft)	19 - 21 N·m (14 - 15 lb ft)
Light (L)	8 mm	M14 x 1.5	20 - 25 N·m (15 - 18 lb ft)	25 - 30 N·m (18 - 22 lb ft)	15 - 18 N·m (11 - 13 lb ft)	15 - 17 N·m (11 - 13 lb ft)	29 - 32 N·m (21 - 24 lb ft)
Light (L)	10 mm	M16 x 1.5	28 - 35 N·m (21 - 26 lb ft)	35 - 40 N·m (26 - 30 lb ft)	25 - 28 N·m (18 - 21 lb ft)	25 - 28 N·m (18 - 21 lb ft)	38 - 42 N·m (28 - 31 lb ft)
Light (L)	12 mm	M18 x 1.5	35 - 45 N·m (26 - 33 lb ft)	40 - 45 N·m (30 - 33 lb ft)	27 - 30 N·m (20 - 22 lb ft)	35 - 39 N·m (26 - 29 lb ft)	48 - 53 N·m (35 - 39 lb ft)
Light (L)	15 mm	M22 x 1.5	50 - 60 N·m (37 - 44 lb ft)	60 - 70 N·m (44 - 52 lb ft)	50 - 60 N·m (37 - 44 lb ft)	45 - 50 N·m (33 - 37 lb ft)	67 - 74 N·m (49 - 55 lb ft)
Light (L)	18 mm	M26 x 1.5	70 - 85 N·m (52 - 63 lb ft)	85 - 95 N·m (63 - 70 lb ft)	60 - 75 N·m (44 - 55 lb ft)	85 - 94 N·m (63 - 69 lb ft)	86 - 95 N·m (63 - 70 lb ft)
Light (L)	22 mm	M30 x 2	100 - 115 N·m (74 - 85 lb ft)	105 - 120 N·m (77 - 89 lb ft)	85 - 105 N·m (63 - 77 lb ft)	110 - 121 N·m (81 - 89 lb ft)	114 - 126 N·m (84 - 93 lb ft)
Light (L)	28 mm	M36 x 2	125 - 145 N·m (92 - 107 lb ft)	135 - 150 N·m (100 - 111 lb ft)	120 - 140 N·m (89 - 103 lb ft)	130 - 143 N·m (96 - 105 lb ft)	152 - 168 N·m (112 - 124 lb ft)
Light (L)	35 mm	M45 x 2	170 - 215 N·m (125 - 159 lb ft)	250 - 280 N·m (184 - 207 lb ft)	170 - 190 N·m (125 - 140 lb ft)	215 - 237 N·m (159 - 175 lb ft)	238 - 263 N·m (176 - 194 lb ft)
Light (L)	42 mm	M52 x 2	260 - 330 N·m (192 - 243 lb ft)	270 - 300 N·m (199 - 221 lb ft)	190 - 230 N·m (140 - 170 lb ft)	330 - 363 N·m (243 - 268 lb ft)	361 - 399 N·m (266 - 294 lb ft)

24° cone connectors (DKO) - Metallic tube connections conforming to ISO 8434-1

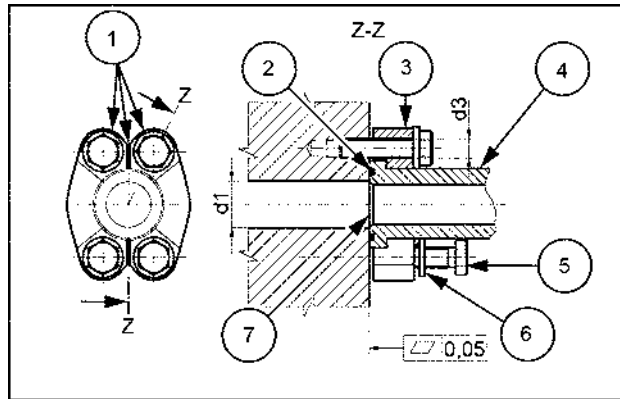
Series	Tube outer diameter	Thread size	Recommended	ALFAGOMMA	FOR	PARKER	VOSS
Heavy (S)	6 mm	M14 x 1.5	22 - 28 N·m (16 - 21 lb ft)	25 - 30 N·m (18 - 22 lb ft)	14 - 16 N·m (10 - 12 lb ft)	25 - 28 N·m (18 - 21 lb ft)	24 - 26 N·m (18 - 19 lb ft)
Heavy (S)	8 mm	M16 x 1.5	30 - 40 N·m (22 - 30 lb ft)	35 - 40 N·m (26 - 30 lb ft)	25 - 28 N·m (18 - 21 lb ft)	40 - 44 N·m (30 - 32 lb ft)	38 - 42 N·m (28 - 31 lb ft)
Heavy (S)	10 mm	M18 x 1.5	35 - 50 N·m (26 - 37 lb ft)	40 - 45 N·m (30 - 33 lb ft)	27 - 30 N·m (20 - 22 lb ft)	50 - 55 N·m (37 - 41 lb ft)	48 - 53 N·m (35 - 39 lb ft)
Heavy (S)	12 mm	M20 x 1.5	45 - 60 N·m (33 - 44 lb ft)	45 - 50 N·m (33 - 37 lb ft)	43 - 54 N·m (32 - 40 lb ft)	60 - 66 N·m (44 - 49 lb ft)	57 - 63 N·m (42 - 46 lb ft)
Heavy (S)	16 mm	M24 x 1.5	65 - 80 N·m (48 - 59 lb ft)	75 - 85 N·m (55 - 63 lb ft)	60 - 75 N·m (44 - 55 lb ft)	80 - 88 N·m (59 - 65 lb ft)	81 - 89 N·m (60 - 66 lb ft)
Heavy (S)	20 mm	M30 x 2	100 - 120 N·m (74 - 89 lb ft)	105 - 120 N·m (77 - 89 lb ft)	90 - 110 N·m (66 - 81 lb ft)	120 - 132 N·m (89 - 97 lb ft)	133 - 147 N·m (98 - 108 lb ft)
Heavy (S)	25 mm	M36 x 2	140 - 170 N·m (103 - 125 lb ft)	135 - 150 N·m (100 - 111 lb ft)	125 - 145 N·m (92 - 107 lb ft)	170 - 187 N·m (125 - 138 lb ft)	181 - 200 N·m (133 - 148 lb ft)
Heavy (S)	30 mm	M42 x 2	190 - 250 N·m (140 - 184 lb ft)	205 - 230 N·m (151 - 170 lb ft)	170 - 190 N·m (125 - 140 lb ft)	250 - 275 N·m (184 - 203 lb ft)	257 - 284 N·m (190 - 209 lb ft)
Heavy (S)	38 mm	M52 x 2	260 - 350 N·m (192 - 258 lb ft)	270 - 300 N·m (199 - 221 lb ft)	200 - 245 N·m (148 - 181 lb ft)	350 - 385 N·m (258 - 284 lb ft)	380 - 420 N·m (280 - 310 lb ft)

3. 4-bolt flange connections conforming to ISO 6162-1 and SAE J518-1 (Code 61) and to ISO 6162-2 and SAE J518-2 (Code 62):

NOTE:

Torque values according ISO 6162:

- It is important that all screws be lightly torqued before applying the final recommended torque values to avoid breaking the split flange clamps or one-piece flange clamps during installation.
- Calculated with a coefficient of friction at 0.17.

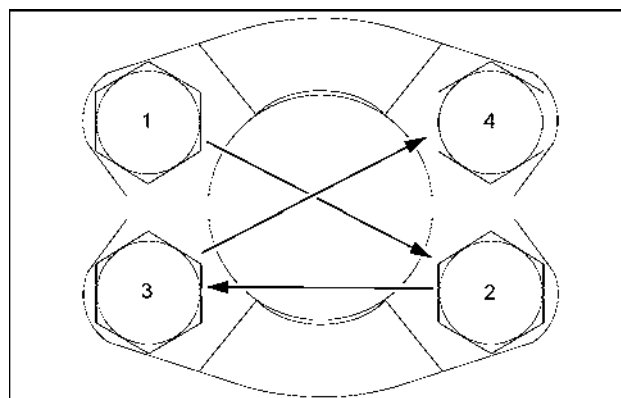


SS14G153 3

Position	Designation
1	Shape optional
2	O-ring
3	Flange clamp
4	Flanged head
5	Screw
6	Hardened washer
7	Face of port on adapter, pump, etc.

Assembly:

- A. Make sure sealing surfaces are free of burrs, nicks, scratches or any contamination.
- B. Lubricate the O-ring lightly with system fluid or compatible lubricant.
- C. Position flange and clamp halves.
- D. Place lock washers on bolts and bolt through clamp halves.
- E. Finger tighten all four bolts making certain the flange and fitting shoulder are started squarely. **ALL BOLTS MUST BE EVENLY TORQUED.** Do not tighten any one bolt fully before going on to the next one. Partially tighten each bolt as shown below and repeat this sequence until all bolts are tightened to the specified torque for that bolt size.



SS14G150 4

4-bolt flange connections conforming to ISO 6162-1 and SAE J518-1 (Code 61)

At a pressure of 35 - 350 bar (508 - 5075 psi)

Metric screws – Class 10.9

Dash size	Nominal size (Drill) Metric d1	Nominal size (Drill) Inch d1	Screw Thread Metric d3	Recommended According ISO 6162 (SAE J518)	ALFAGOMMA	PARKER	VOSS
-8	13 mm	1/2	M8	32 - 35 N·m (24 - 26 lb ft)	20 - 25 N·m (15 - 18 lb ft)	24 - 26 N·m (18 - 19 lb ft)	23 - 25 N·m (17 - 18 lb ft)
-12	19 mm	3/4	M10	70 - 77 N·m (52 - 57 lb ft)	28 - 40 N·m (21 - 30 lb ft)	50 - 55 N·m (37 - 41 lb ft)	45 - 50 N·m (33 - 37 lb ft)
-16	25 mm	1	M10	70 - 77 N·m (52 - 57 lb ft)	37 - 48 N·m (27 - 35 lb ft)	50 - 55 N·m (37 - 41 lb ft)	45 - 50 N·m (33 - 37 lb ft)
-20	32 mm	1 1/4	M10	70 - 77 N·m (52 - 57 lb ft)	48 - 62 N·m (35 - 46 lb ft)	50 - 55 N·m (37 - 41 lb ft)	45 - 50 N·m (33 - 37 lb ft)
-24	38 mm	1 1/2	M12	130 - 143 N·m (96 - 105 lb ft)	62 - 79 N·m (46 - 58 lb ft)	92 - 101 N·m (68 - 74 lb ft)	77 - 85 N·m (57 - 63 lb ft)
-32	51 mm	2	M12	130 - 143 N·m (96 - 105 lb ft)	73 - 90 N·m (54 - 66 lb ft)	92 - 101 N·m (68 - 74 lb ft)	77 - 85 N·m (57 - 63 lb ft)
-40	64 mm	2 1/2	M12	130 - 143 N·m (96 - 105 lb ft)	107 - 124 N·m (79 - 91 lb ft)	92 - 101 N·m (68 - 74 lb ft)	77 - 85 N·m (57 - 63 lb ft)
-48	76 mm	3	M16	295 - 325 N·m (218 - 240 lb ft)	186 - 203 N·m (137 - 150 lb ft)	210 - 231 N·m (155 - 170 lb ft)	189 - 210 N·m (139 - 155 lb ft)

4-bolt flange connections conforming to ISO 6162-2 and SAE J518-2 (Code 62)

At a pressure of 420 bar (6090 psi)

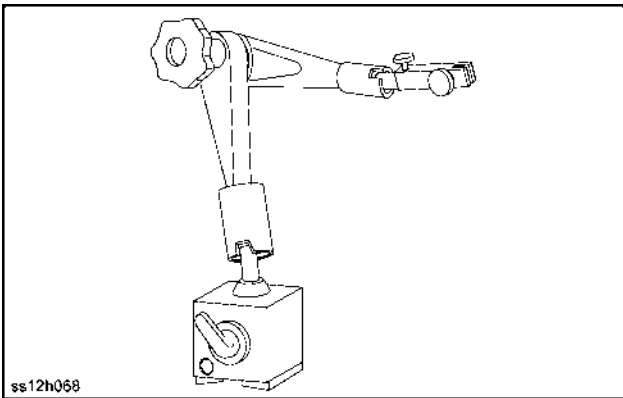
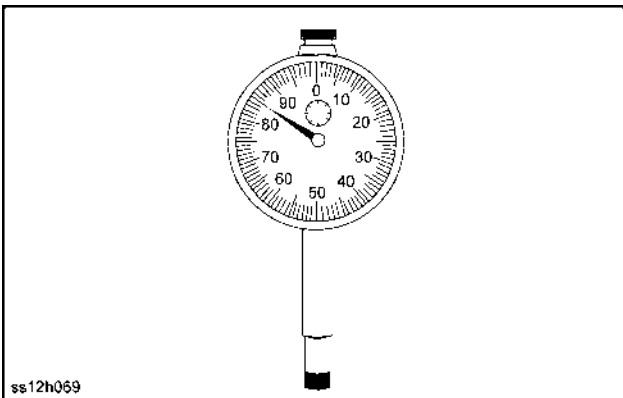
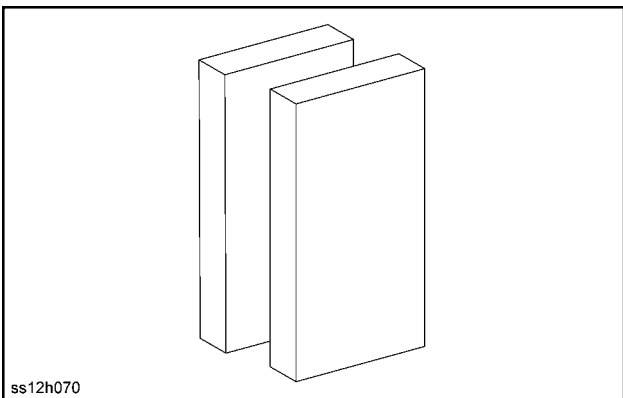
Metric screws – Class 10.9

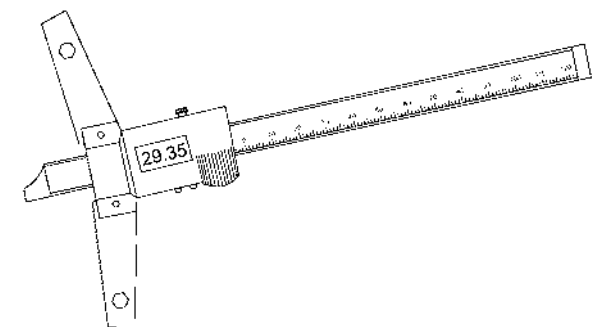
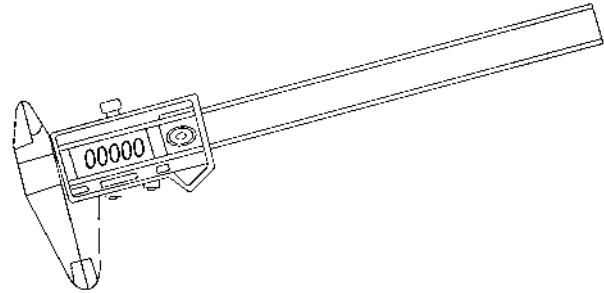
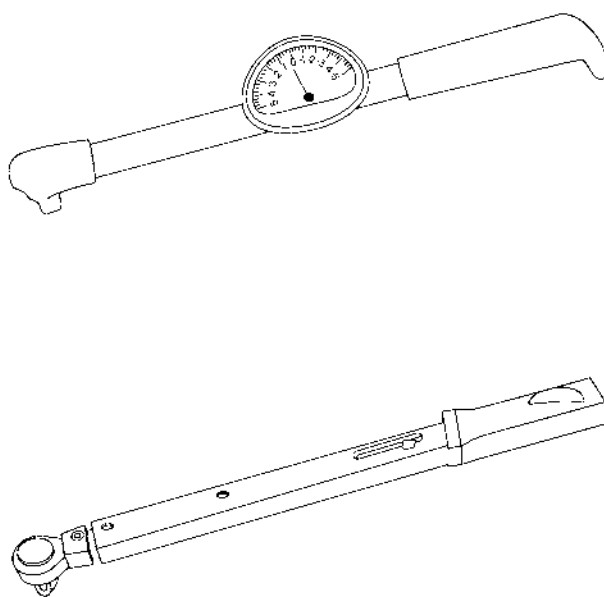
Dash size	Nominal size (Drill) Metric d1	Nominal size (Drill) Inch d1	Screw Thread Metric d3	Recommended According ISO 6162 (SAE J518)	ALFAGOMMA	PARKER	VOSS
-8	13 mm	1/2	M8	32 - 35 N·m (24 - 26 lb ft)	20 - 25 N·m (15 - 18 lb ft)	24 - 26 N·m (18 - 19 lb ft)	23 - 25 N·m (17 - 18 lb ft)
-12	19 mm	3/4	M10	70 - 77 N·m (52 - 57 lb ft)	34 - 45 N·m (25 - 33 lb ft)	50 - 55 N·m (37 - 41 lb ft)	45 - 50 N·m (33 - 37 lb ft)
-16	25 mm	1	M12	130 - 143 N·m (96 - 105 lb ft)	56 - 68 N·m (41 - 50 lb ft)	92 - 101 N·m (68 - 74 lb ft)	77 - 85 N·m (57 - 63 lb ft)
-20	32 mm	1 1/4	M12	130 - 143 N·m (96 - 105 lb ft)	85 - 102 N·m (63 - 75 lb ft)	130 - 143 N·m (96 - 105 lb ft)	117 - 130 N·m (86 - 96 lb ft)
-24	38 mm	1 1/2	M16	295 - 325 N·m (218 - 240 lb ft)	158 - 181 N·m (117 - 133 lb ft)	210 - 231 N·m (155 - 170 lb ft)	189 - 210 N·m (139 - 155 lb ft)
-32	51 mm	2	M20	550 - 605 N·m (406 - 446 lb ft)	271 - 294 N·m (200 - 217 lb ft)	400 - 440 N·m (295 - 325 lb ft)	

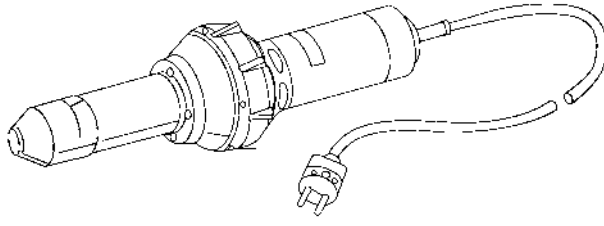
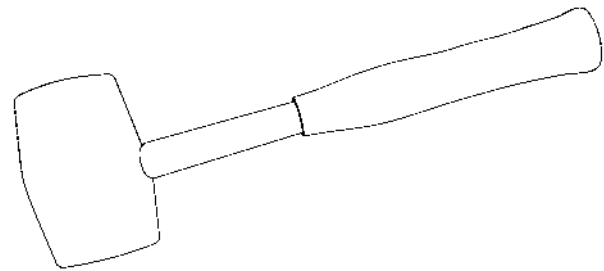
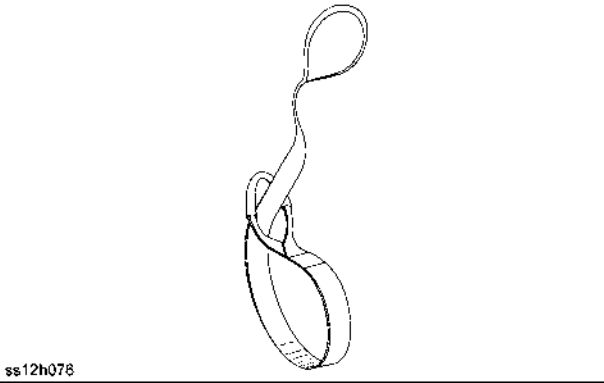
Special tools

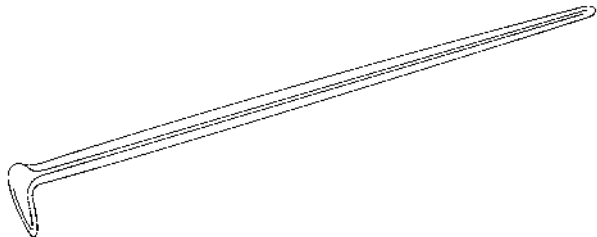
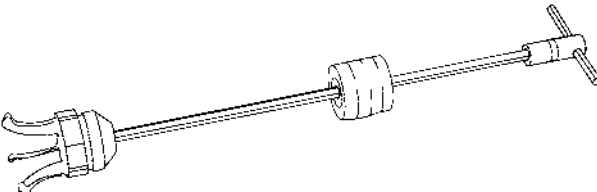
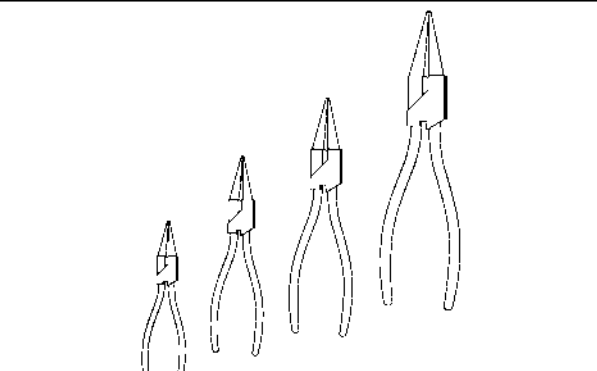
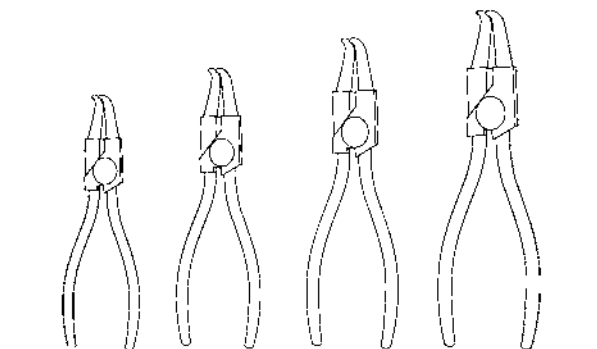
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F106.8	WE
F156.8A	WE
F156.8	WE

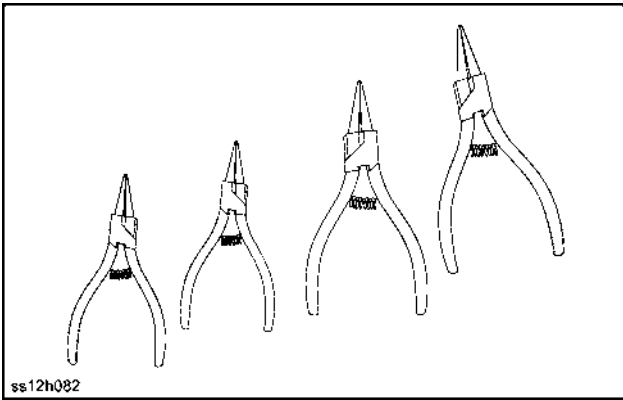
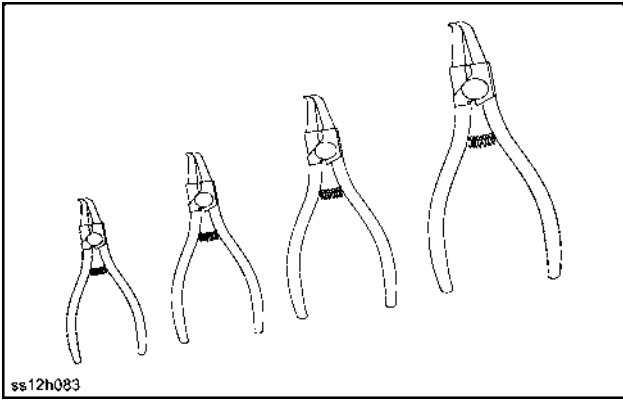
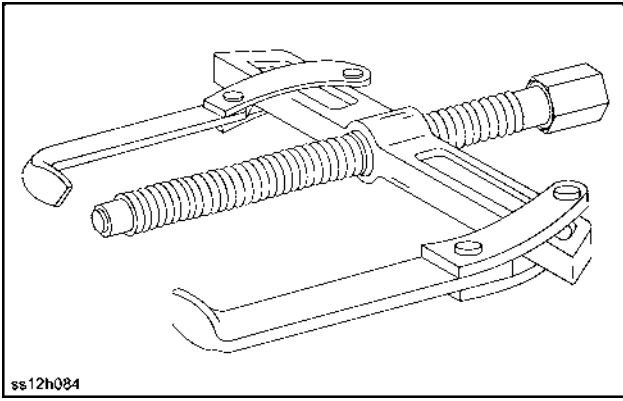
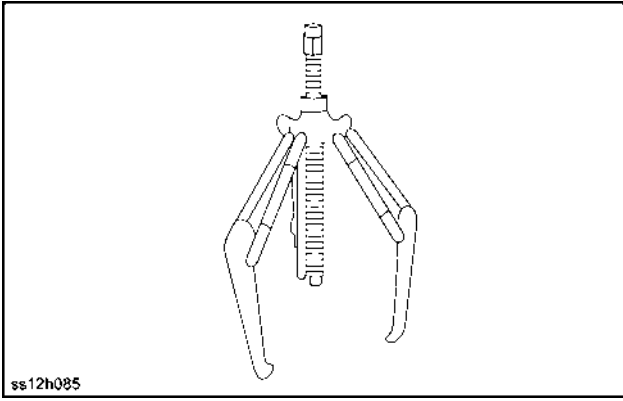
Commercially available tools for disassembly/assembly

Item No.	Figure	Designation
1	 ss12h068 SS12H068 1	Magnet holder
2	 ss12h069 SS12H069 2	Dial indicator
3	 ss12h070 SS12H070 3	Final dimensions 70 mm (2.8 in) 100 mm (3.9 in)

Item No.	Figure	Designation
4	 ss12h071 SS12H071 4	Digital depth gauge 200 mm (7.9 in) 300 mm (11.8 in)
5	 ss12h072 SS12H072 5	Digital calliper gauge 150 mm (5.9 in)
6	 ss12h073 SS12H073 6	Torque wrench 0.6 - 6.0 N·m (0.4 - 4.4 lb ft) 1.0 - 12 N·m (0.7 - 8.9 lb ft) 0.23 - 3 N·m (0.2 - 2.2 lb ft) 5.0 - 45 N·m (3.7 - 33.2 lb ft)

Item No.	Figure	Designation
7	 ss12h074 SS12H074 7	Hot air blower
8	 ss12h075 SS12H075 8	Plastic mallet Ø 28.4 mm (1.1 in)
9	 ss12h076 SS12H076 9	Lifting strap
10	 ss12h077 SS12H077 10	Sling chain

Item No.	Figure	Designation
11	 ss12h078 SS12H078 11	Pry bar
12	 ss12h079 SS12H079 12	Hammer puller
13	 ss12h080 SS12H080 13	Set of internal pliers I1-I2-I3-I4
14	 ss12h081 SS12H081 14	Set of internal pliers I11-I21-I31-I41 90 °

Item No.	Figure	Designation
15	 ss12h082 SS12H082 15	Set of external pliers A1-A2-A3-A4
16	 ss12h083 SS12H083 16	Set of external pliers A01-A02-A03-A04 90 °
17	 ss12h084 SS12H084 17	Two-arm puller Span 80 mm (3.1 in) Throat depth 100 mm (3.9 in) Span 120 mm (4.7 in) Throat depth 125 mm (4.9 in) Span 170 mm (6.7 in) Throat depth 125 mm (4.9 in) Span 200 mm (7.9 in) Throat depth 175 mm (6.9 in) Span 250 mm (9.8 in) Throat depth 200 mm (7.9 in) Span 350 mm (13.8 in) Throat depth 250 mm (9.8 in) Span 380 mm (15.0 in) Throat depth 200 mm (7.9 in) Span 520 mm (20.5 in) Throat depth 300 - 500 mm (11.8 - 19.7 in)
18	 ss12h085 SS12H085 18	Three-armed extractor Span 85 mm (3.3 in) Throat depth 65 mm (2.6 in) Span 130 mm (5.1 in) Throat depth 105 mm (4.1 in) Span 230 mm (9.1 in) Throat depth 150 mm (5.9 in) Span 295 mm (11.6 in) Throat depth 235 mm (9.3 in) Span 390 mm (15.4 in) Throat depth 270 mm (10.6 in) Span 640 mm (25.2 in) Throat depth 300 mm (11.8 in)

Basic instructions - Shop and assembly

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

NOTE: With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.

4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or NEW HOLLAND CONSTRUCTION Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or NEW HOLLAND CONSTRUCTION Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
 - Position the welder ground clamp as close to the welding area as possible.
 - If you weld in close proximity to a computer module, then you should remove the module from the machine.
 - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

5. Remove the battery ground cable. Reconnect the cable when you complete welding.

WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Failure to comply could result in death or serious injury.

W0111A

Special tools

The special tools that NEW HOLLAND CONSTRUCTION suggests and illustrate in this manual have been specifically researched and designed for use with NEW HOLLAND CONSTRUCTION machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Basic instructions – Precaution for disassembly and assembly

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Preparations for disassembly

- Thoroughly wash the machine before bringing it into the shop. Bringing a dirty machine into the shop may cause machine components to be contaminated during disassembling/assembling, resulting in damage to machine components, as well as decreased efficiency in service work.
- Be sure to thoroughly understand all disassembling/assembling procedures beforehand, to help avoid incorrect disassembling of components as well as personal injury.
- Check and record the items listed below to prevent problems from occurring in the future.
 1. The machine model, machine serial number, and hour meter reading.
 2. Reason for disassembly (symptoms, failed parts, and causes).
 3. Clogging of filters and oil, water or air leaks, if any.
 4. Capacities and condition of lubricants.
 5. Loose or damaged parts.
- Prepare the necessary tools to be used and the area for disassembling work.
- Wear appropriate clothing, safety shoes, safety helmet, goggles, and clothes with long sleeves.
- Confirm ready access to a first-aid kit and fire extinguisher, as well as appropriate emergency personnel contacts in the case of a medical accident or fire.
- Before performing any work on the machine, follow lockout/tagout procedures by attaching a “maintenance in progress tag”. This tag can be applied on the dashboard, on the cab door, or at any other well visible place. Notify those with access to the machine that you will be performing the maintenance.

Disassembling and assembling hydraulic equipment

- Before removing lines, release the pressure of hydraulic oil tank.
- Drain the oil in removed lines into an appropriate container to prevent oil contamination.
- Protect open connections with plugs or caps to prevent oil from leaking and debris from contaminating the system.
- Thoroughly clean the outside of components before disassembling, and drain hydraulic oil and gear oil before disassembly.

Disassembling hydraulic equipment

- Impaired performance and function of hydraulic equipment after unauthorized service may not be covered under warranty by the manufacturer. Consult your local dealer for service.
- If it is unavoidably necessary to disassemble and modify, it should be carried out by experts or personnel qualified through service training.
- Make match mark on parts for reassembling.
- Before disassembling, read instructions in advance, and determine if the service is required to be performed by an authorized dealer.
- Use appropriate specialty tools and jigs if required.
- If parts can not be removed as specified by the procedure, never force removal. Check for other failures that may be causing binding or interference.
- Inspect parts for wear and clearance; record the measured values. Replace components if the values fall outside of the recommended range.
- If an abnormality is detected, repair or replace the parts.

- When removing parts, use appropriate markings or labels to ensure they can be reinstalled in the correct order and location without confusion.
- For common parts, pay attention to the quantity and locations of each group of components.

Reassembling hydraulic equipment

- Clean parts in a well ventilated room.
- Remove residual oil with compressed air, and apply fresh hydraulic oil or gear oil to surfaces before reassembly.
- Replace removed o-rings, back-up rings and oil seals with new ones. Apply gear oil on them before reassembling.
- Thoroughly clean and dry surfaces on which liquid sealant must be reapplied.
- Before assembling, remove rust preventives on new parts.
- Use special tools to fit bearings, bushing and oil seal.
- Assemble parts matching to the marks.
- After completion, check that there is no omission of parts.

Basic instructions – Electrical equipment precautions

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

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Failure to comply could result in death or serious injury.

W0111A

- The disassembly of electrical equipment is not allowed.
- Handle equipment with care so as not to drop it or bump it.
- Connector should be removed by unlocking while holding the connector.
- Never disconnect electrical plugs by pulling on the wires. Always use only the electrical connectors to make the disconnection.
- Check that connector is connected and locked completely.
- Engine key off before removing and connecting connector.
- Engine key off before touching terminals of starter and alternator.
- Wash machine with care so as not to splash water on electrical equipment and connector.
- If water has entered a sealed connection, thoroughly dry both connectors before reconnecting
- Remove battery grounding terminal before beginning work close to battery and battery relay with tools.

Basic instructions – Hydraulic contamination

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Contamination in the hydraulic system is a major cause of the malfunction of hydraulic components. Contamination is any foreign material in the hydraulic oil.

Contamination can enter the hydraulic system in several ways:

- When you drain the oil or disconnect any line
- When you disassemble a component
- From normal wear of the hydraulic components
- From damaged seals or worn seals
- From a damaged component in the hydraulic system

All hydraulic systems operate with some contamination. The design of the components in this hydraulic system permits efficient operation with a small amount of contamination. An increase in this amount of contamination can cause problems in the hydraulic system.

The following list includes some of these problems:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- Movement of control valve spools is difficult
- Hydraulic oil that becomes too hot
- Pump gears, housing, and other parts that wear rapidly
- Relief valves or check valves held open by dirt
- Quick failure of components that have been repaired
- Slow cycle times are slow. The machine does not have enough power.

If your machine has any of these problems, check the hydraulic oil for contamination.

There are two types of contamination: microscopic and visible.

Microscopic contamination occurs when very fine particles of foreign material are suspended in the hydraulic oil. These particles are too small to see or feel. Microscopic contamination can be found by identification of the following problems or by testing in a laboratory.

Examples of problems caused by microscopic contamination:

- Cylinder rod seals that leak
- Control valve spools that do not return to neutral
- The hydraulic system has a high operating temperature

Visible contamination is foreign material that can be found by sight, touch, or odor. Visible contamination can cause a sudden failure of components.

Examples of problems caused by visible contamination:

- Particles of metal or dirt in the oil
- Air in the oil
- Dark or thick oil
- Oil with an odor of burned oil
- Water in the oil

If you find contamination, use a portable filter to clean the hydraulic system.

Basic instructions – Biodiesel fuel

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Introduction to Fatty Acid Methyl Ester (FAME) biodiesel

FAME biodiesel, called biodiesel fuel in the following section, consists of a family of fuels derived from vegetable oils treated with methyl esters.

There are two main biodiesel fuel types: Rapeseed Methyl Ester (RME) and Soybean Methyl Ester (SME). RME is a blend of rapeseed and sunflower methyl ester, and is the preferred crop in Europe. SME is the preferred crop in the United States.

Biodiesel fuel is a renewable alternative fuel source. Its use and development is promoted worldwide, especially in Europe and in the United States.

NOTICE: Your emissions control system is compatible with up to **7 %** biodiesel fuel (B7). Be aware that the use of biodiesel fuel that does not comply with the standards mentioned in this section could lead to severe damage to the engine, fuel system or aftertreatment system of your machine. The use of non-approved fuels may void NEW HOLLAND CONSTRUCTION Warranty coverage.

Biodiesel can be used to run Tier 4b diesel engines only when blended with standard diesel fuel:

- B7: indicates the blend of **7 %** biodiesel and **93 %** diesel fuels.
- B20: indicates the blend of **20 %** biodiesel and **80 %** diesel fuels. Do not use.

Biodiesel fuel has several positive features in comparison with diesel fuel:

- Biodiesel adds lubricity to the fuel, which is beneficial in many circumstances, particularly as sulfur and aromatics are removed from the fuel.
- Biodiesel has a greater cetane number and burns cleaner.
- Biodiesel produces less particulate matter and reduces smoke emissions.
- Biodiesel is fully biodegradable and non-toxic.

Diesel and biodiesel fuel specifications

Tier 4b diesel fuel specifications are covered by the following:

- **EN 590** - Specification of Diesel fuel. (10 ppm sulfur maximum.)

Biodiesel blends are covered by:

- European Diesel Fuel Specification **EN 590** allows up to **7 %** biodiesel since 2009. European fuel suppliers are allowed to use up to **7 %** biodiesel fuel (B7) to supply the network.

Pure biodiesel blend stock (B100) specification is covered by the following requirements:

- Europe: **EN14214** - Automotive fuels. Fatty Acid Methyl Ester (FAME) for diesel engines. Requirements and test methods.
- **DIN V 51606** - German standard for biodiesel.

Before raw oil can be converted into usable biodiesel fuel, it must undergo transesterification to remove glycerides. During the transesterification process, the oil reacts with an alcohol to separate the glycerine from the fat or vegetable oil. This process leaves behind two products: methyl ester (the chemical name for biodiesel) and glycerine (a byproduct usually sold for use in soaps or other products).

NOTICE: Biodiesel fuels approved for use in the NEW HOLLAND CONSTRUCTION equipment must be transesterified and comply with the European Standard **EN14214** or the German standard **DIN V 51606**.

NOTICE: Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel, are fuels that are normally made from Rapeseed oil or similar high oil content crops. These kinds of fuel are not transesterified, so they do not fulfil the **EN14214** requirements. There is no recognized quality standard available for these types of fuel. Therefore the use of Cold Pressed Biodiesel, Cold Pressed Oil,

Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel are NOT APPROVED at any blend in any NEW HOLLAND CONSTRUCTION product.

NOTICE: Any engine and fuel injection equipment fitted to a NEW HOLLAND CONSTRUCTION vehicle found to have run with any blend of NON-APPROVED fuel (fuel not fulfilling the specification described in the requirement **EN14214**) will no longer be covered for Warranty by NEW HOLLAND CONSTRUCTION.

Biodiesel fuel usage conditions

You must stringently follow the biodiesel fuel usage conditions. Incorrect application of the biodiesel fuel usage conditions could lead to severe damage to the engine, fuel injection equipment and aftertreatment system.

The main concerns related to operation with biodiesel fuels are:

- Filters and injector blockage caused by poor fuel quality.
- Wear and corrosion of internal components due to water content, which affects lubricity.
- Deterioration of some rubber sealing compounds in the fuel system.
- Biodiesel oxidation, which can lead to the formation of deposits that can harm the fuel injection system.

NOTICE: Any problem in the engine fuel injection equipment associated with non-compliance to the following conditions for biodiesel fuel handling and maintenance will not be covered for Warranty by NEW HOLLAND CONSTRUCTION.

Purchase biodiesel fuel from a trusted supplier who understands the product and maintains acceptable fuel quality.

The use of biodiesel blends up to B7 will not void the NEW HOLLAND CONSTRUCTION warranty as long as the following conditions for biodiesel fuel handling and maintenance are stringently followed:

Biodiesel fuel must be pre-blended by the supplier. Mixing biodiesel fuels on-site can result in an incorrect mixture that could damage the engine and/or fuel system.

NOTICE: NEW HOLLAND CONSTRUCTION may void your warranty if the problem is associated with poor fuel quality due to improper blending. It is the responsibility of the fuel supplier and/or yourself to ensure the right type of fuel and blend is delivered and used.

Storage

The machine should not be stored for more than 6 months with biodiesel in the fuel system. For longer storage time, it is strongly suggested that only regular **EN 590** or #2 diesel fuel is used.

NOTE: If storage for longer than 6 months is necessary, the engine must be run on regular **EN 590** or #2 diesel for a minimum of 20 hours to flush the biodiesel fuel out of the fuel system prior to storage.

Biodiesel is highly hygroscopic and tends to collect water more than diesel fuel. This increases the risk of algae and bacteria growth which can cause severe damage to the fuel injection system. Keep the machine fuel tanks and on-site storage tanks as full as possible to limit the amount of air and water vapors inside the tank. Drain water from the tanks at least once a week.

NOTICE: Use only NEW HOLLAND CONSTRUCTION approved biocide additives on Tier 4b engines with an exhaust aftertreatment system.

Capacities

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

Component		F106.8	F106.8A	F156.8	F156.8A
Engine with engine oil filter		about 12.5 l (3.3 US gal)	about 12.5 l (3.3 US gal)	about 12.5 l (3.3 US gal)	about 12.5 l (3.3 US gal)
Hydraulic system	Initial filling	about 170 l (44.9 US gal)	about 185 l (48.9 US gal)	about 185 l (48.9 US gal)	about 200 l (52.8 US gal)
	For oil change	about 70 l (18.5 US gal)	about 70 l (18.5 US gal)	about 90 l (23.8 US gal)	about 90 l (23.8 US gal)
Powershift transmission	Initial filling	about 27 l (7.1 US gal)	about 27 l (7.1 US gal)	about 27 l (7.1 US gal)	about 27 l (7.1 US gal)
	For oil change	about 21 l (5.5 US gal)	about 21 l (5.5 US gal)	about 21 l (5.5 US gal)	about 21 l (5.5 US gal)
Differential gear Side reducer gear		about 31 l (8.2 US gal)	about 31 l (8.2 US gal) about 31	about 36 l (9.5 US gal)	about 36 l (9.5 US gal) about 36
Tandem (chain case) Swing unit		2 x about 60 l (15.9 US gal)	2 x about 60 l (15.9 US gal)	2 x about 64 l (16.9 US gal)	2 x about 64 l (16.9 US gal)
Blade slewing gear		about 2 l (0.5 US gal)	about 2 l (0.5 US gal)	about 2.5 l (0.7 US gal)	about 2.5 l (0.7 US gal)
Cooling system with heating (OAT EG2 50-50 Premix)	The coolant is a 50:50 mixture with water	about 32.0 L (8.5 US gal)	about 32.0 L (8.5 US gal)	about 32.0 L (8.5 US gal)	about 32.0 L (8.5 US gal)
Fuel tank		about 278.0 L (73.4 US gal)	about 278.0 L (73.4 US gal)	about 278.0 L (73.4 US gal)	about 278.0 L (73.4 US gal)
Diesel Exhaust Fluid (DEF)/AdBlue® tank		54.0 L (11.9 UK gal)	54.0 L (11.9 UK gal)	54.0 L (11.9 UK gal)	54.0 L (11.9 UK gal)
Windshield washer tank		2.0 L (0.4 UK gal)	2.0 L (0.4 UK gal)	2.0 L (0.4 UK gal)	2.0 L (0.4 UK gal)
Refrigerant R134a		1.2 kg (2.6 lb)	1.2 kg (2.6 lb)	1.2 kg (2.6 lb)	1.2 kg (2.6 lb)

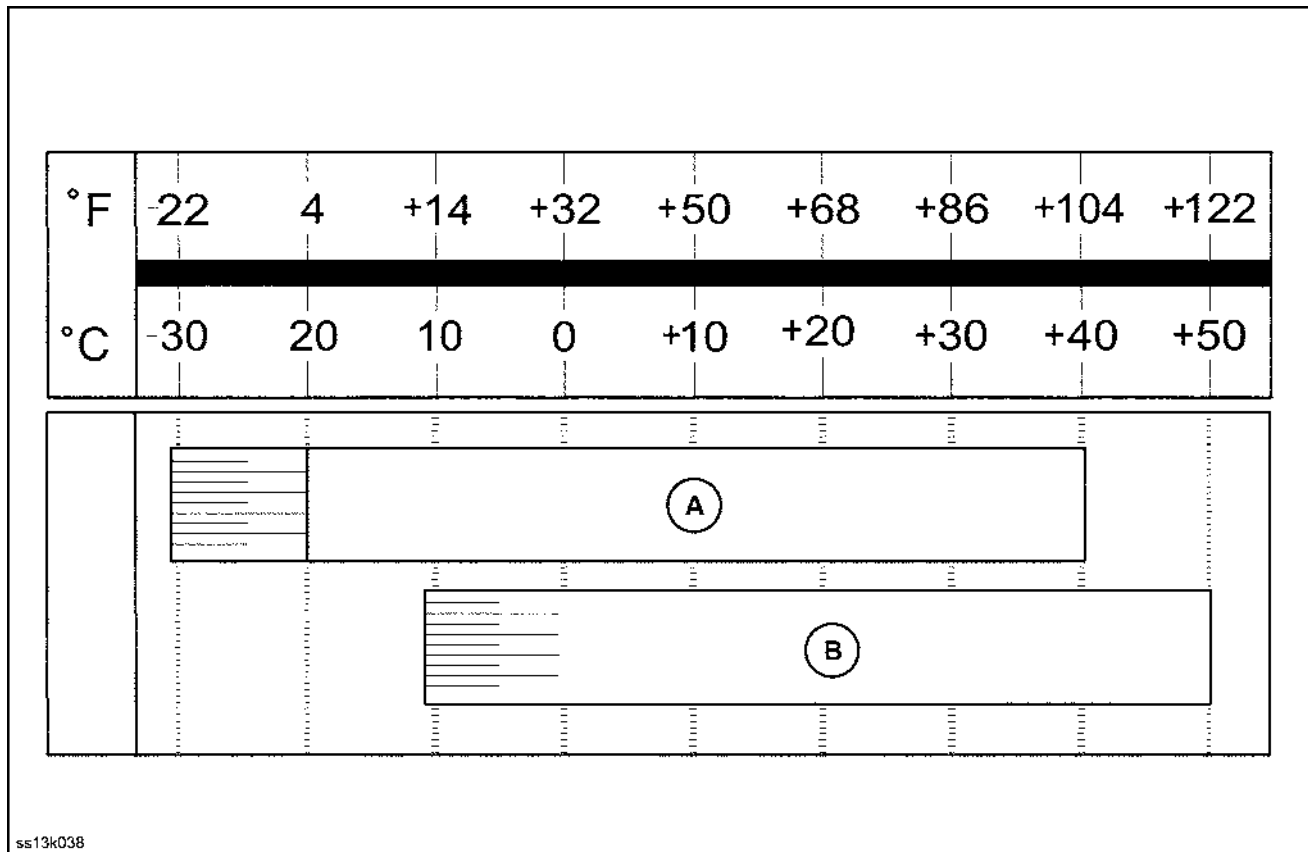
Consumables

F106.8A	WE
F106.8	WE
F156.8A	WE
F156.8	WE

I. Oils for internal combustion engines (change interval 500 OH) Standard

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II. Oils for hydraulic systems, mineral



SS13K038 1

Specification:

- DIN 51524 HVLP

Oils

(A)

- ISO VG 46 (NH 646 H)
e.g.: AMBRA HYDROSYSTEM 46HV

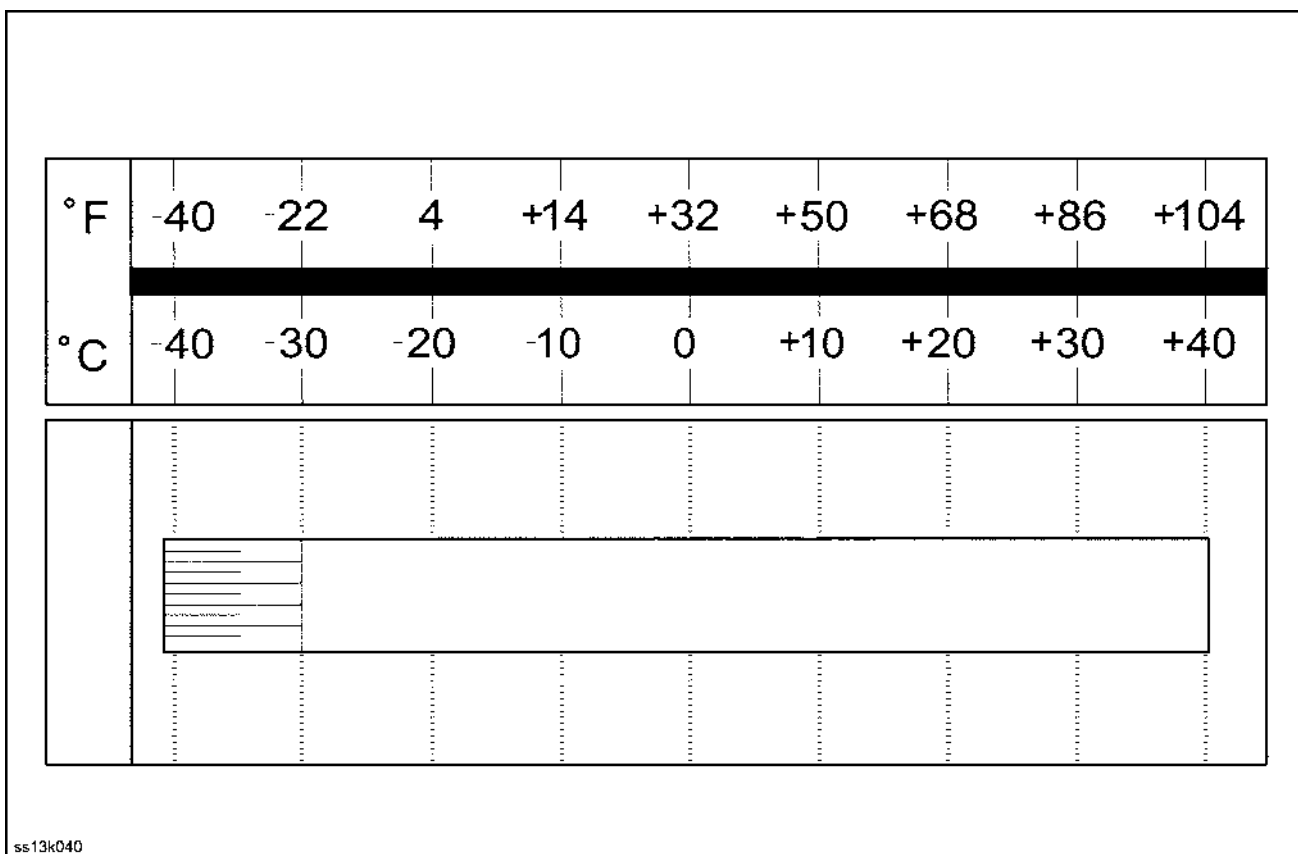
(B)

- ISO VG 68 (NH 668 HV)
e.g.: AMBRA HYDROSYSTEM 68 HV
AKCELA AW HYDRAULIC FLUID 68 HV



The hydraulic system must be warmed up before commencing work. Warm up the hydraulic system for approx. **10 min**, with the engine at half-speed and repeated actuation of all control valves.

II. Oils for hydraulic systems, biodegradable



Specification:

- DIN 51524 HVLP

Oils

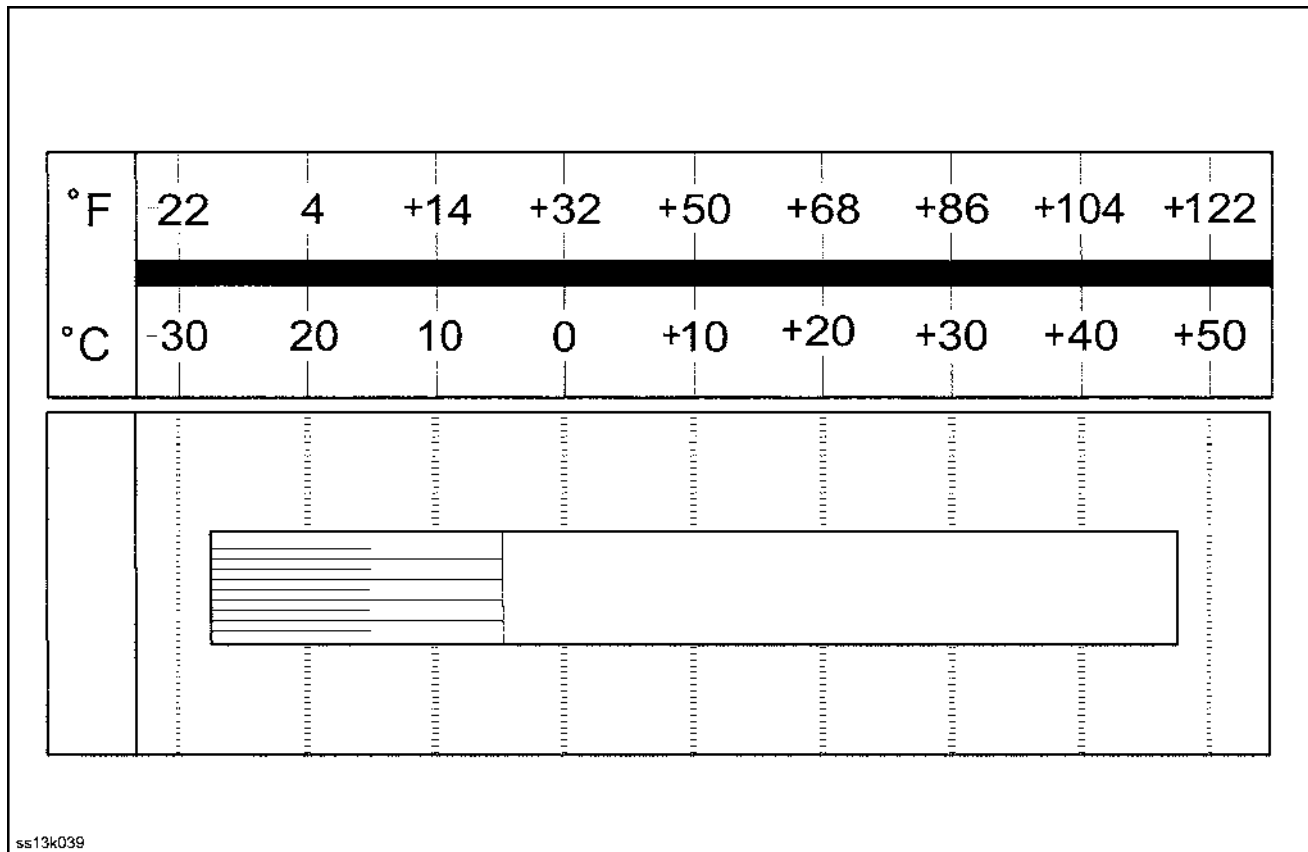
ISO VG 46 (NH 646 BS)

e.g.: AMBRA HYDROSYSTEM 46 BIO-S



The hydraulic system must be warmed up before commencing work. Warm up the hydraulic system for approx. **10 min**, with the engine at half-speed and repeated actuation of all control valves.

III. Oils for powershift transmissions with Ergopower



SS13K039 3

Specification:

- API: CI-4
- ACEA: E7

API: American Petroleum Institute

ACEA: Association des Constructeurs Européen d'Automobiles g.i.e.

Oils

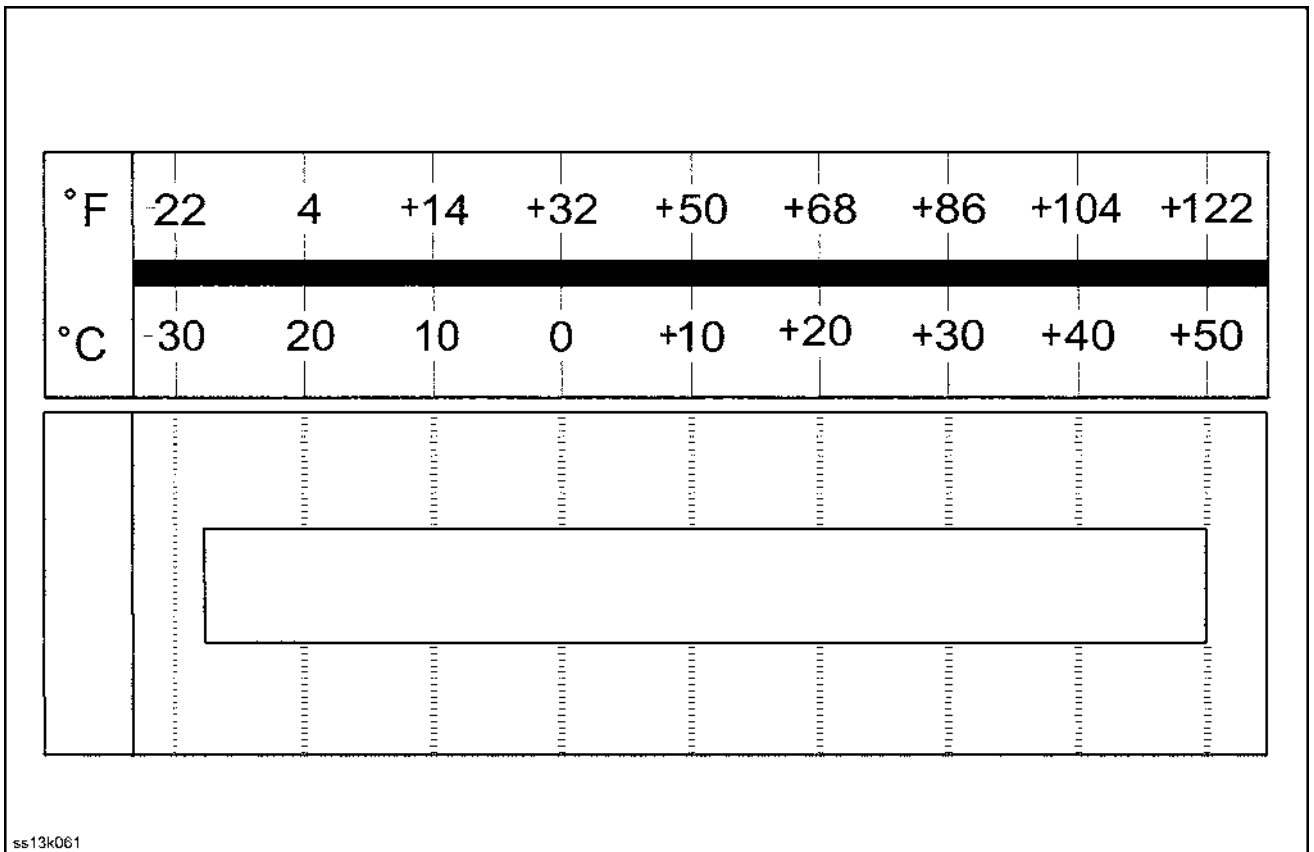
SAE 15W-40 (NH 330 H)

e.g.: AMBRA MASTERGOLD HSP 15W-40



Automatic powershift transmission-preheating.

IV.A. Oils for differential gear on rear axle



SS13K061 4

NOTICE: Axles and gearboxes may be damaged by low-grade oils.

Specification:

- API: GL 5 LS additive

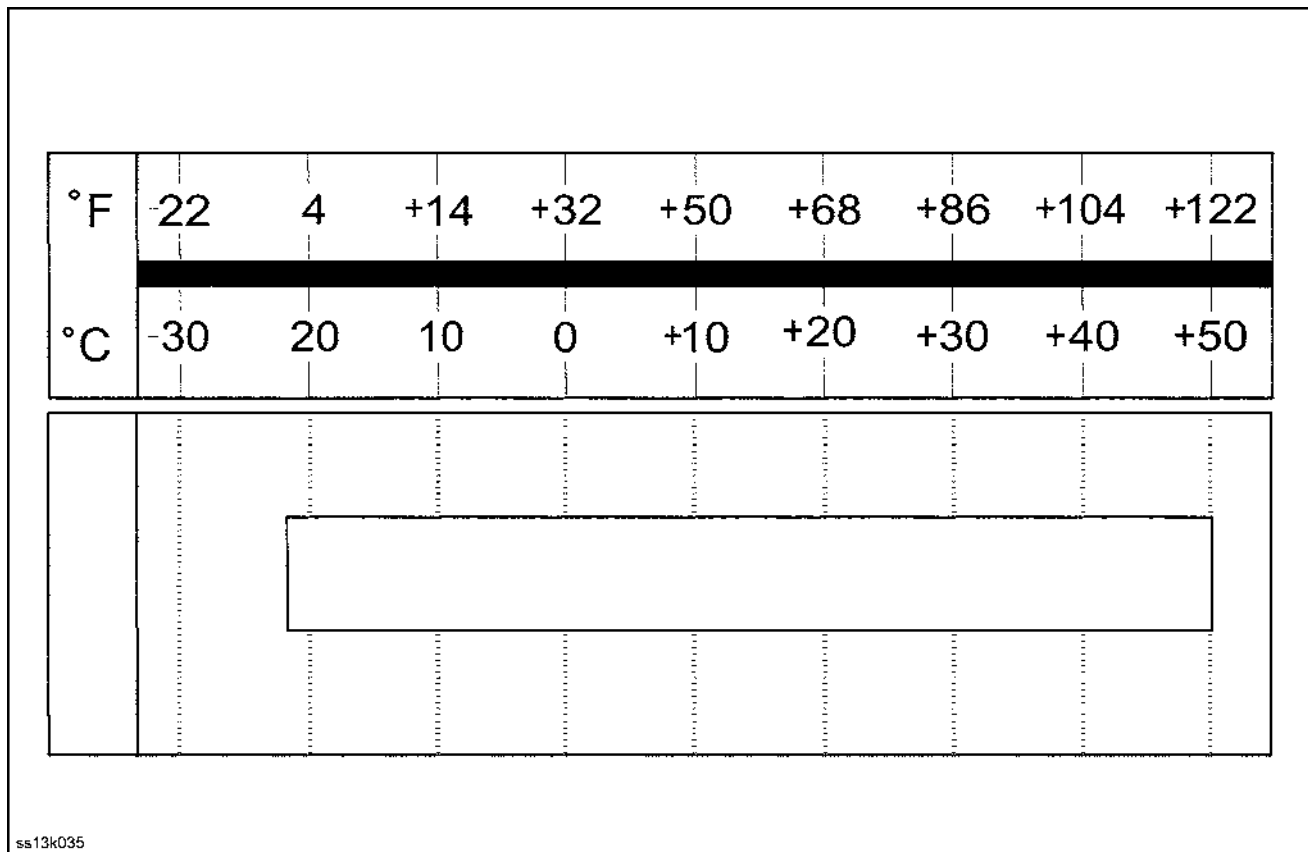
API: American Petroleum Institute

LS: Limited slip

Oils

SAE 80W-90 (NH 520 C)
e.g.: AMBRA AXF 80W-90

IV.B. Oils for tandem box on rear axle



SS13K035 5

NOTICE: Axles and gearboxes may be damaged by low-grade oils.

Specification:

- API: GL 4

API: American Petroleum Institute

Oils

SAE 20W-40 (NH 434 B)
e.g.: AMBRA TRX 20W-40
Titan Utto ZF 20W-40

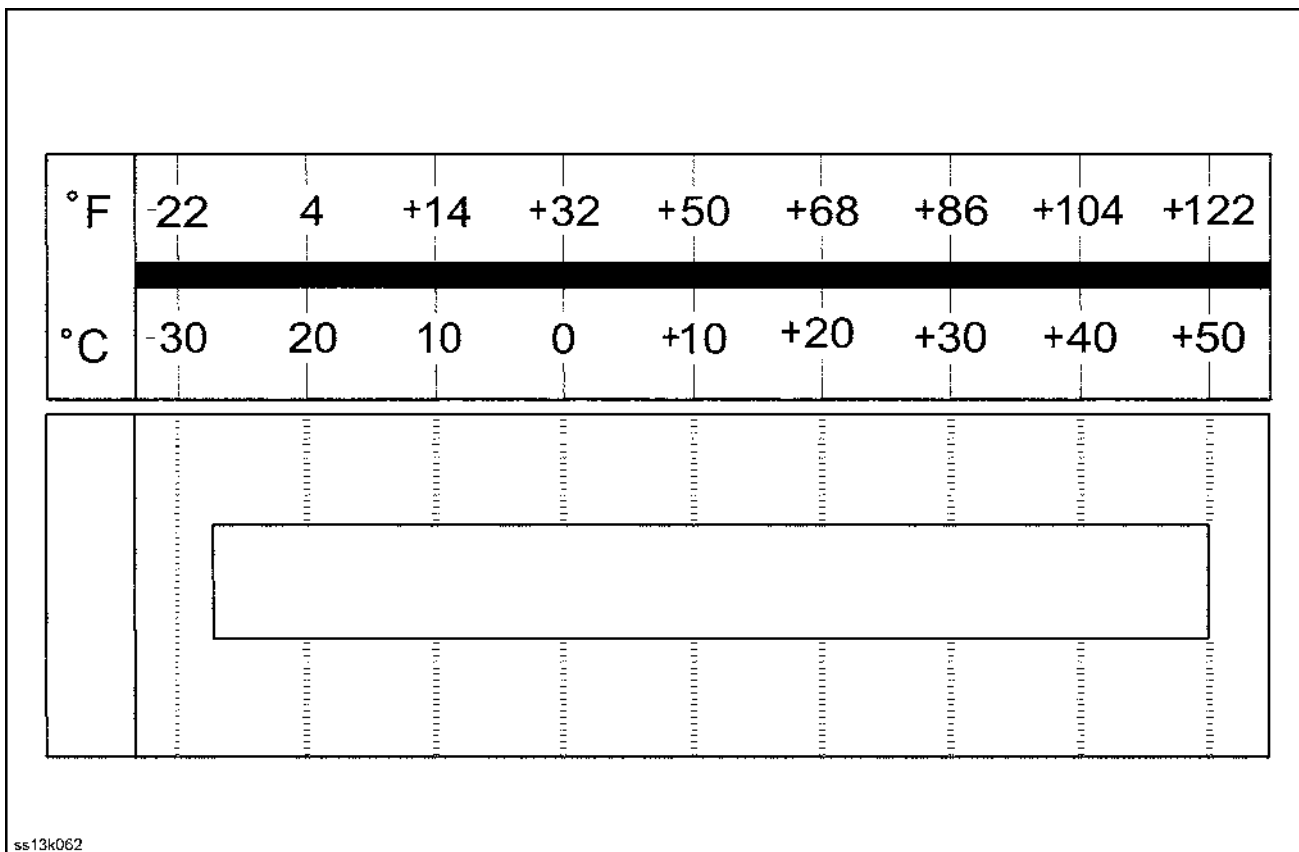
LS-additive: **0 - 0.1 %**

S: **0 %**

P: **0.15 %**

P+S: Phosphor and sulphur alloy corresponding to delivery specification: 2293219

IV.C. Oils for blade slewing gear



ss13k062

SS13K062 6

NOTICE: Axles and gearboxes may be damaged by low-grade oils.

Specification:

- API: GL 5

API: American Petroleum Institute

Oils

HYPOIDE SAE 80W-90 (NH 520 A)
e.g.: AMBRA HYPOIDE 90 80W-90

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