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(*) See content for specific models

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Safety rules

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 which, if not avoided, will result in death or serious injury.

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

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, 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 which, 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 which clarifies steps, procedures, or other information in this manual.*

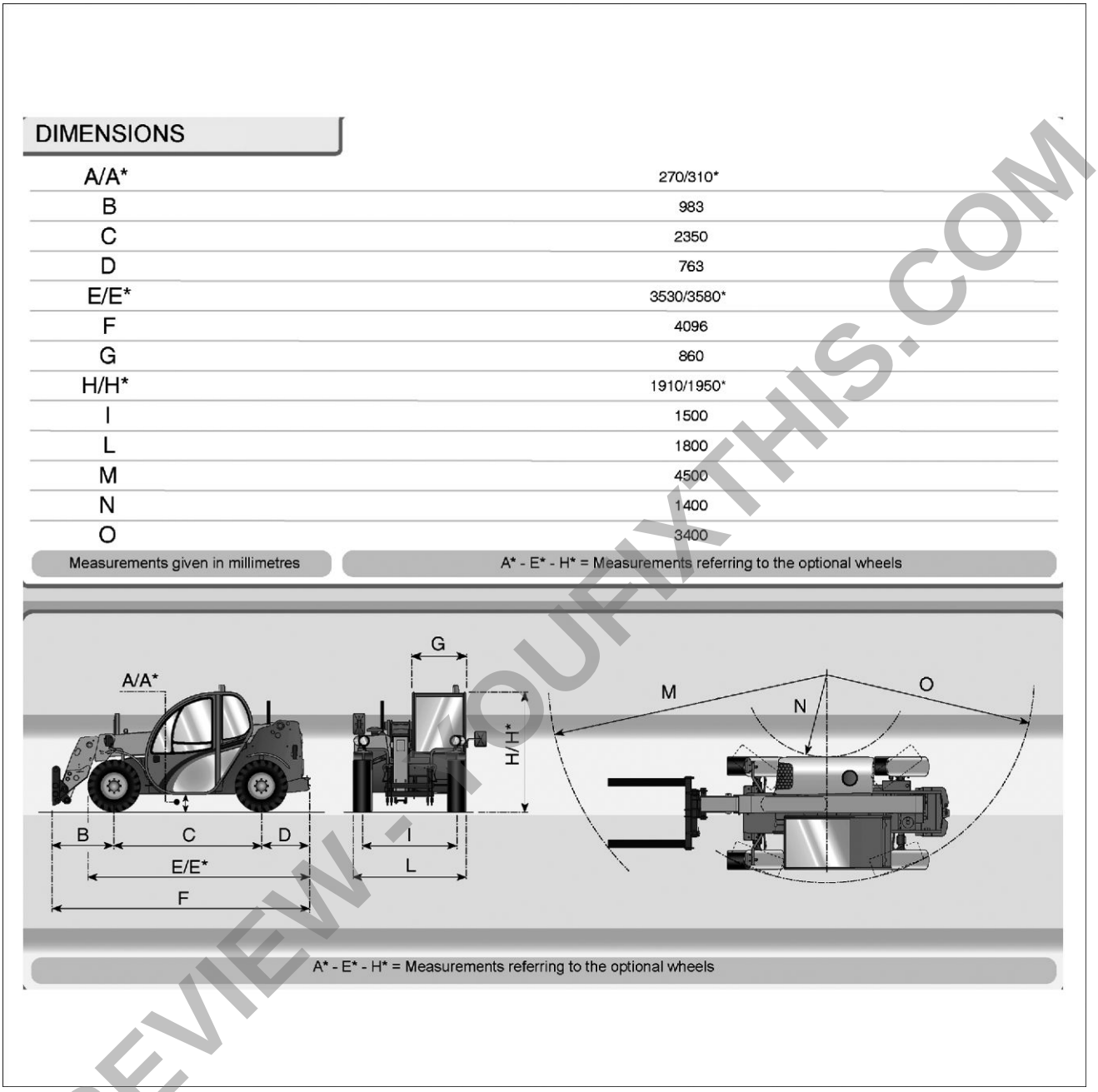
Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

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Dimension

LM5020	

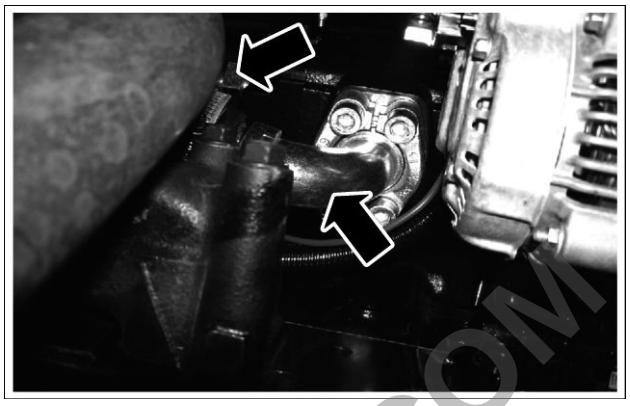


LEIL13TLH1730GA 1

PERFORMANCE	
Maximum capacity	**2.500 kg**
Maximum lifting height	**5.78 m**
Maximum horizontal radius	**3.25 m**
Radius at maximum height	**0.67 m**
Fork traversing angle	**129 °**
Breakout force	**5.700 daN**
Towing capacity	**4.400 daN**
Maximum negotiable gradient	**40 %**
Total weight with no load	**4.800 kg**
Max speed	**26 km/h**

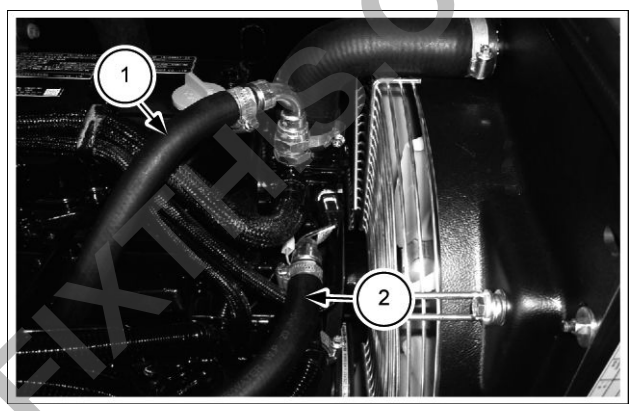
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Remove the hoses from the hydraulic pump.



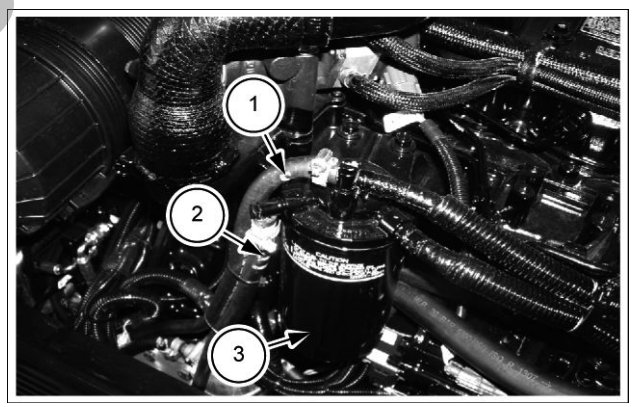
LEIL13TLH1743AA 11

Remove the hoses **(1)** and **(2)**.



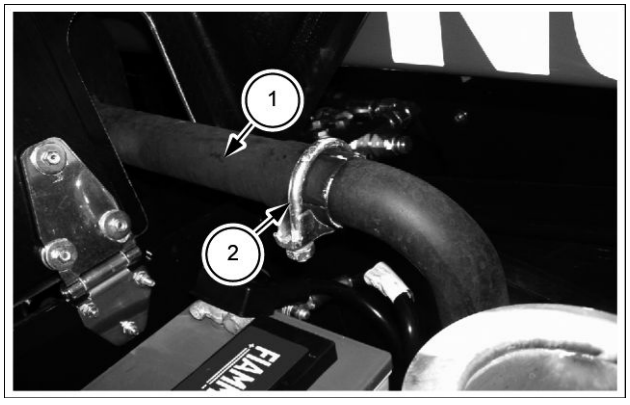
LEIL13TLH1744AA 12

Remove the hoses **(1)** and **(2)** from the fuel filter **(3)**.



LEIL13TLH1745AA 13

Disconnect the exhaust pipe outlet **(1)** on the intake manifold by removing the U-bracket **(2)**.



LEIL13TLH1746AA 14

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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 the heat near pipes with fluids under pressure, with the result of serious scalds for the persons hit. Do not weld or use torches near pipes containing fluids or other flammable materials.

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

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

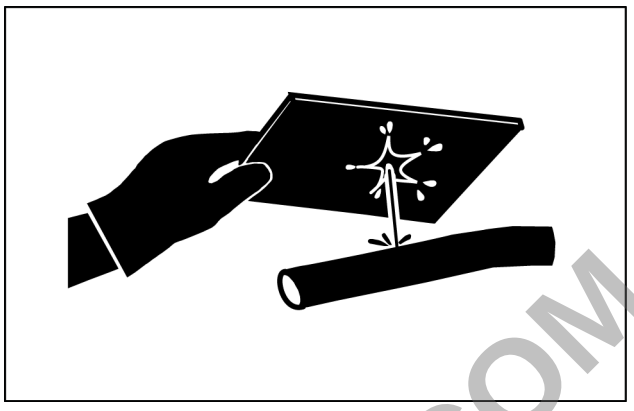
Have any visible leakage repaired immediately.

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

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

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

Always store hydraulic oil in the original containers.

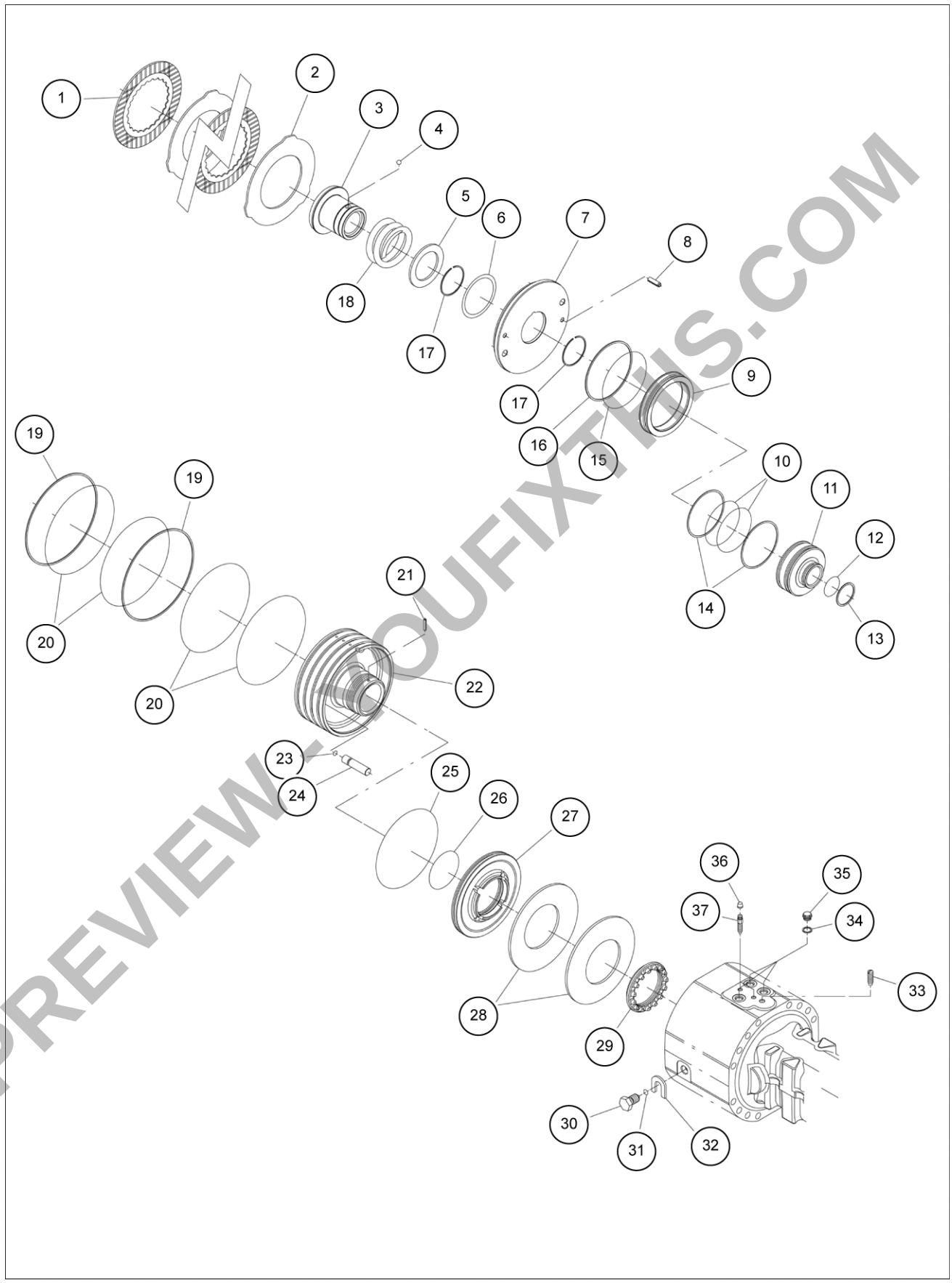


TULI12WEX2013AA 9

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Differential - Exploded view



LEIL12TLH0776HA 1

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Bolts with fine pitch

A. Friction coefficient

B. Preload (N)

C. Fastening torque (Nm)

	A	4.8		5.8		6.8		8.8		10.9		12.9	
		B	C	B	C	B	C	B	C	B	C	B	C
M8	0.10	9798.1	10.87	12247.6	13.59	14697.1	16.31	19596.1	21.75	27557.1	30.58	33068.5	36.70
	0.14	9079.5	13.53	11349.4	16.91	13619.3	20.29	18159.1	27.05	25536.2	38.04	30643.4	45.65
M10	0.10	15296.9	21.13	19121.1	26.41	22945.3	31.69	30593.8	42.25	43022.5	59.42	51627.0	71.30
	0.14	14175.0	26.27	17718.8	32.84	21262.6	39.41	28350.1	52.55	39867.3	73.89	47840.8	88.67
M10	0.10	16383.6	22.12	20479.5	27.66	24575.4	33.19	32767.2	44.25	46078.8	62.23	55294.6	74.67
	0.14	15221.6	27.80	19027.0	34.75	22832.5	41.70	30443.3	55.61	42810.8	78.20	51373.0	93.84
M12	0.10	22020.7	35.83	27525.9	44.79	33031.0	53.75	44041.4	71.67	61933.2	100.78	74319.8	120.94
	0.14	20405.8	44.53	25507.2	55.66	30608.7	66.79	40811.6	89.06	57391.3	125.24	68869.5	150.29
M12	0.10	23333.7	37.26	29167.1	46.57	35000.6	55.88	46667.4	74.51	65626.1	104.78	78751.3	125.74
	0.14	21669.2	46.70	27086.5	58.38	32503.8	70.06	43338.4	93.41	60944.6	131.36	73133.5	157.63
M14	0.10	31610.0	59.04	39512.5	73.80	47415.0	88.57	63220.0	118.09	88903.1	166.06	106683.7	199.27
	0.14	29345.9	73.92	36682.4	92.40	44018.9	110.89	58691.9	147.85	82535.4	207.91	99042.5	249.49
M16	0.10	42581.3	89.78	53226.6	112.23	63871.9	134.67	85162.5	179.56	119759.8	252.51	143711.8	303.02
	0.14	39587.8	113.06	49484.7	141.32	59381.6	169.59	79175.5	226.12	111340.6	317.98	133608.7	381.57
M18	0.10	51457.2	124.03	64321.5	155.03	77185.8	186.04	102914.4	248.06	144723.3	348.83	173668.0	418.59
	0.14	47751.7	155.02	59689.6	193.78	71627.5	232.53	95503.3	310.05	134301.6	436.00	161161.9	523.20
M18	0.10	55415.1	130.17	69268.9	162.72	83122.7	195.26	110830.3	260.35	155855.1	366.12	187026.1	439.34
	0.14	51577.6	164.67	64472.0	205.84	77366.4	247.01	103155.2	329.35	145062.1	463.15	174074.5	555.77
M20	0.10	65534.1	173.72	81917.7	217.16	98301.2	260.59	131068.3	347.45	184314.8	488.60	221177.8	586.32
	0.14	60886.2	218.17	76107.8	272.71	91329.3	327.26	121772.4	436.34	171242.5	613.61	205491.0	736.33
M20	0.10	70114.7	181.58	87643.3	226.97	105172.0	272.36	140229.3	363.15	197197.5	51.68	236637.0	612.82
	0.14	65319.1	230.55	81648.8	288.19	97978.6	345.82	130638.1	461.10	183709.9	648.42	220451.9	778.10
M22	0.10	81220.8	236.88	101526.0	296.10	121831.2	355.32	162441.5	473.76	228433.4	666.23	274120.1	799.48
	0.14	75533.9	298.75	94417.4	373.43	113300.9	448.12	151067.8	597.49	212439.1	840.22	254927.0	1008.27
M22	0.10	86164.2	246.02	107705.3	307.53	129246.4	369.04	172328.5	492.05	242337.0	691.94	290804.3	830.33
	0.14	80331.8	313.41	100414.7	391.76	120497.7	470.11	160663.6	626.82	225933.2	881.46	271119.8	1057.75
M24	0.10	98515.6	308.56	123144.5	385.70	147773.4	462.84	197031.1	617.12	277075.0	867.83	332490.0	1041.40
	0.14	91693.3	390.33	114616.6	487.92	137539.9	585.50	183386.5	780.67	257887.3	1097.82	309464.8	1317.38
M22	0.10	104079.4	319.62	130099.2	399.52	156119.0	479.43	208151.7	639.23	292723.2	898.92	351267.9	1878.71
	0.14	97096.0	408.12	121370.1	510.15	145644.1	612.18	194192.1	816.24	273082.6	1147.84	327699.1	1377.41
M27	0.10	127922.3	448.43	159902.9	560.54	191883.5	627.65	255844.7	896.87	359781.6	1261.22	431737.9	1513.46
	0.14	119185.0	569.67	148981.3	712.09	178777.5	854.51	238370.1	1139.34	335207.9	1602.20	402249.5	1922.64
M30	0.10	16817.5	623.80	201021.8	779.75	241226.2	935.70	321635.0	1247.60	452299.2	1754.43	542759.0	2105.32
	0.14	149957.0	795.14	187446.3	993.93	224935.5	1192.72	299914.0	1590.29	421754.2	2236.34	506105.0	2683.61

LEIL14TLH0374GA 2

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Engine - Remove

LM5020	

- Position the machine on a flat and compact surface.
- Apply the parking brake and chock the wheels with wedges.
- Use only the recommended tools.
- Do not insert hands or extraneous components between parts.
- Disconnect the battery before proceeding.

NOTICE: *do not allow unauthorized persons to repair or service this machine. Be certain to read the Operator's Manual with care before starting, operating, servicing, refuelling or repairing this machine.*

Turn the STARTER SWITCH to the OFF position and display the "DO NOT START" warning notice.

NOTICE: *from this point onwards, mark all electrical connections and hydraulic pipes to facilitate the process of RESTORING CONNECTIONS DURING REFITMENT.*

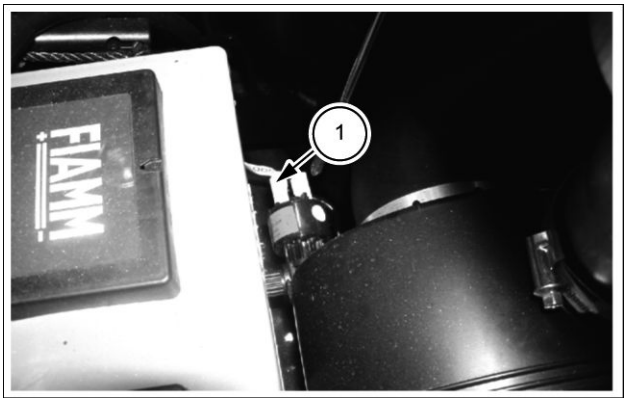
Open and remove the engine hood.



LEIL13TLH1733AA 1

- Unscrew the cap of the hydraulic oil tank slowly to release the air pressure from inside the tank.
- Move the control lever repeatedly back and forth to release pressure in the hydraulic circuit.
- With oil warm, remove plug from the bottom of the machine and drain the oil into a receptacle of suitable capacity.

NOTICE: *fluid under pressure; Before removing the plug or cap, turn slowly to release pressure from the system. See the Use and Maintenance Manual.*



LEIL13TLH1734AA 2

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Engine - General specification

LM5020	

MAIN ENGINE SPECIFICATIONS

Type	Vertical, 4 cycle water-cooled diesel engine
Type of combustion	Direct injection
Bore	**98 mm** (**3.85 in**)
Stroke	**110 mm** (**4.33 in**)
Displacement	**3.319 l** (**202.5 in³**)
Compression ratio	
Turbocharged	18.1
Turbocharged, aftercooled .	18.1
Number of cylinders	4
Cylinder arrangement	In-line
Firing order	1, 3, 4, 2

Engine - General specification

LM5030	

MAIN ENGINE SPECIFICATIONS

Type	Four cylinder and four stroke
Type of combustion	Direct injection
Bore	**105 mm** (**4.1 in**)
Stroke	**127 mm** (**5.0 in**)
Displacement	**4.4 l** (**1.2 US gal**)
Compression ratio Naturally aspirated	19.3:1
Turbocharged	18.2:1
Turbocharged, aftercooled .	18.2:1
Number of cylinders	4
Cylinder arrangement	In-line
Firing order	1, 3, 4, 2

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Consumables

LM5020	

System	Quantity	Type
Engine oil	**13.2 L** (**3.5 US gal**)	**NEW HOLLAND AMBRA UNITEK 10W-40**
Differential oil (front axle)	**4.2 L** (**1.1 US gal**)	**NEW HOLLAND AMBRA HYPOIDE 90 LS**
Reduction gear oil (front wheels)	**0.75 L** (**0.20 US gal**)	**NEW HOLLAND AMBRA HYPOIDE 90 LS**
Differential oil (rear axle)	**4.0 L** (**1.06 US gal**)	**NEW HOLLAND AMBRA HYPOIDE 90 LS**
Reduction gear oil (rear wheels)	**0.90 L** (**0.24 US gal**)	**NEW HOLLAND AMBRA HYPOIDE 90 LS**
Gearbox oil	**4.0 L** (**1.06 US gal**)	**NEW HOLLAND AMBRA HYPOIDE 90 LS**
Brake fluid	**0.8 L** (**0.2 US gal**)	**NEW HOLLAND AMBRA SYNTFLUID 4**
Cooling fluid	**12 L** (**3.2 US gal**)	**NEW HOLLAND AMBRA ACTIFULL™ OT EXTENDED LIFE COOLANT**
Grease	**4 kg** (**8.8 lb**)	**NEW HOLLAND AMBRA GR 75 MD**
Hydraulic oil	**70 L** (**18.5 US gal**)	**NEW HOLLAND AMBRA HYDROSYSTEM 46 HV**
Air conditioning	**1.1 kg** (**2.4 lb**)	**R134A**

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[41.101] Steering control 41.2

Cab climate control 50

[50.200] Air conditioning 50.1

Electrical systems 55

[55.000] Electrical system 55.1

[55.100] Harnesses and connectors 55.2

[55.512] Cab controls 55.3

[55.524] Cab controls (Lift arm, Boom, Dipper, Bucket) 55.4

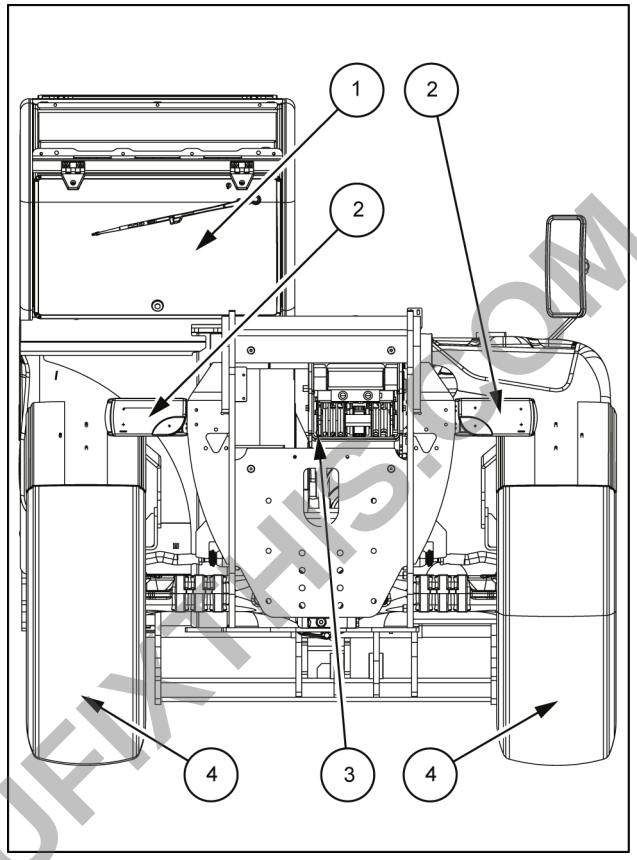
[55.408] Warning indicators, alarms, and instruments 55.5

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Rear view

1. Front window/front emergency exit
2. Front lights
3. Attachment holding plate
4. Front wheels
5. Fuel tank



LEIL13TLH0013BB 5

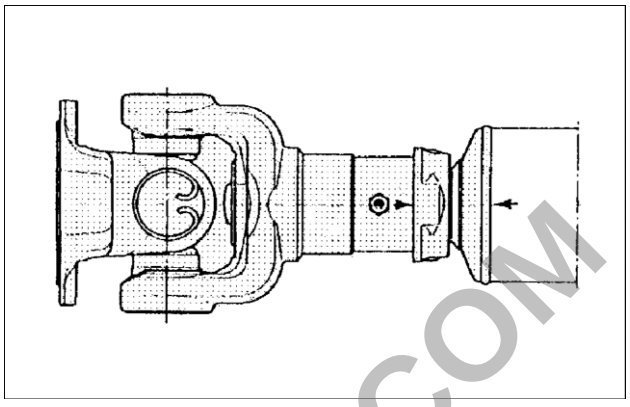
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Spider removal

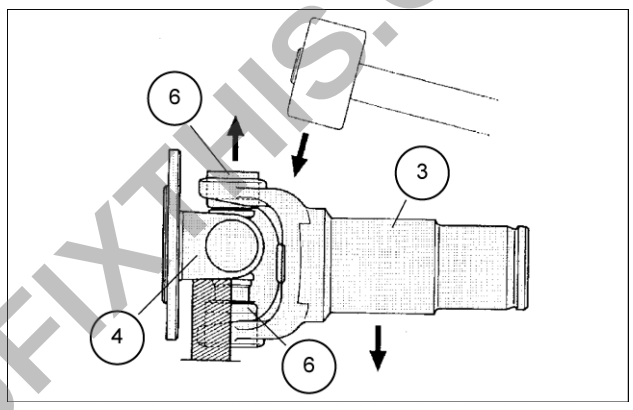
1. Clean the assembly components thoroughly after removing the drive shaft.

NOTE: *since the drive shaft is a sliding assembly, it is recommended to mark the fork and the shaft both sides with a piece of chalk.*



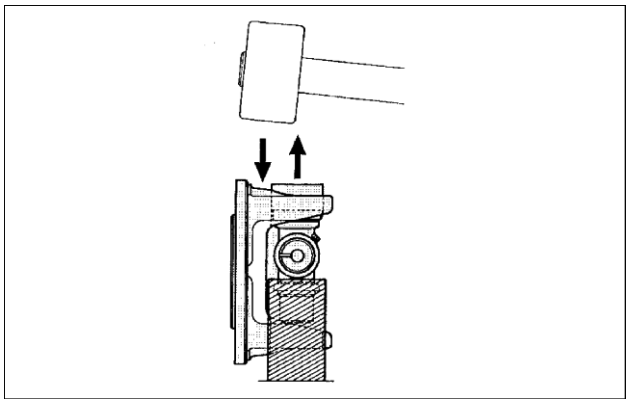
LEIL12TLH1280AA 4

2. Remove the grease nipple from the spider and install flanged fork **(4)** in the jaws of a vice to make it possible to extract drive shaft spider **(3)**.
3. Remove the safety snap rings and hit the shaft upper side with a hammer. Remove bearings **(6)** and the shaft.



LEIL12TLH1281AA 5

4. Place the spider pins on the vice shoes and beat the flanged fork to remove the bearings.
5. Repeat the same operations on the opposite side.



LEIL12TLH1282AA 6

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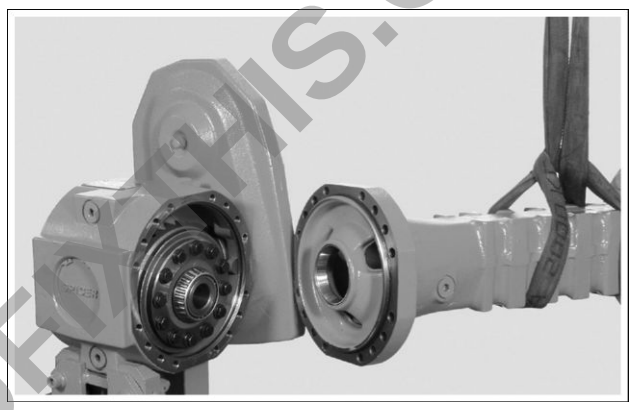
Normal pre loaded differential unit

Remove the brake side arm and the brake discs pack. Sling the arm to be removed and connect it to a hoist, remove screws of the crown wheel side arm.



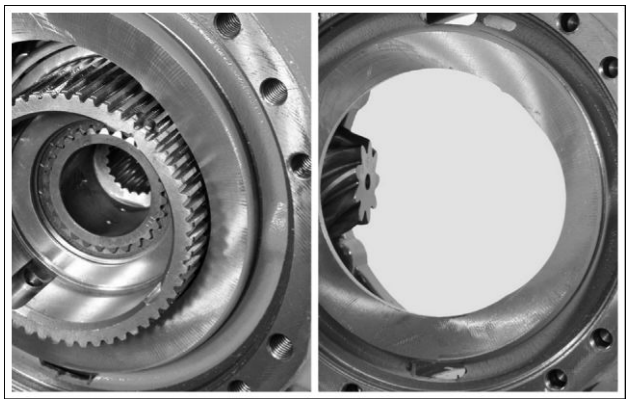
LEIL12TLH0782AA 2

Remove the hydraulic block discs one after the other.



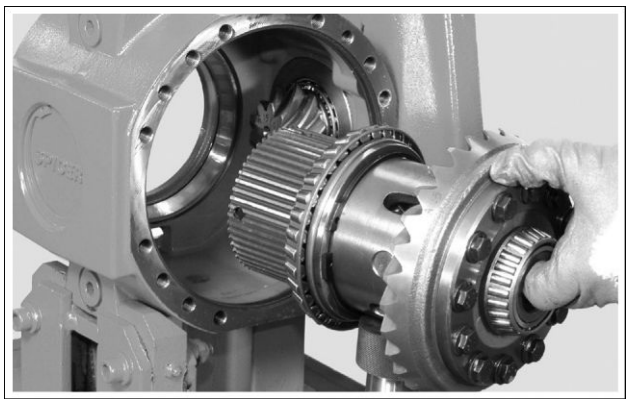
LEIL12TLH0783AA 3

ATTENTION: *Position the differential gear sideways into the recess in order to be able to pull it out.*



LEIL12TLH0784AA 4

Pull out the differential.



LEIL12TLH0785AA 5

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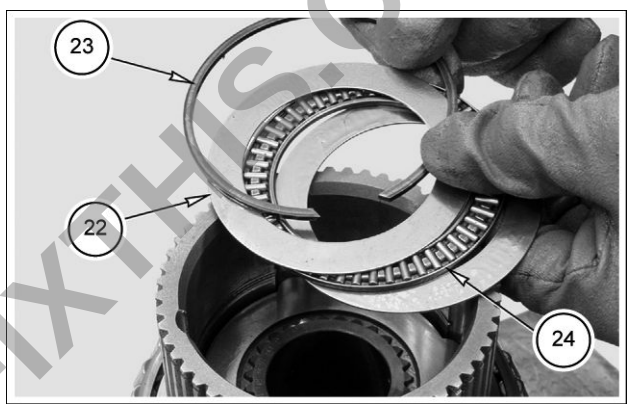
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Remove the snap ring **(23)** that secures the thrust bearing.



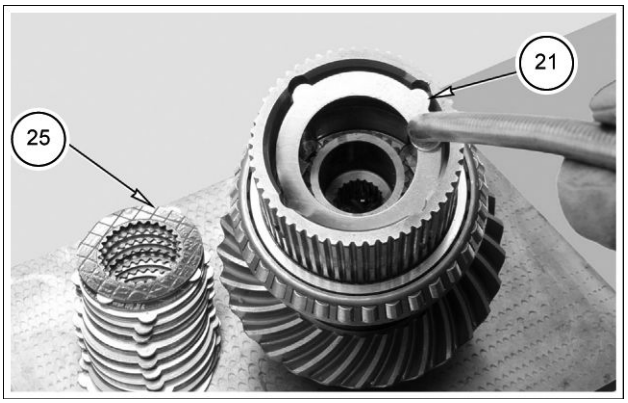
LEIL12TLH0949AA 6

Remove the snap ring **(23)** and thrust bearing **(24)**.



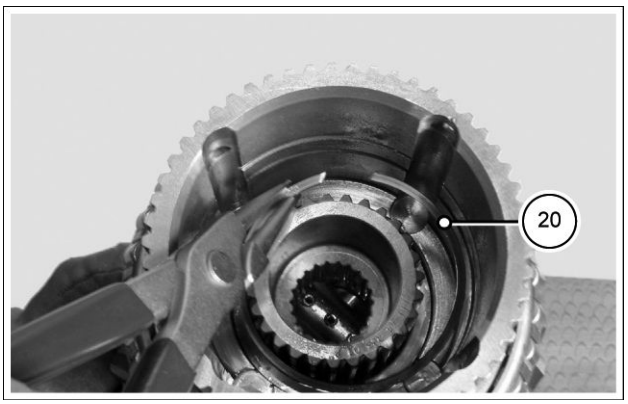
LEIL12TLH0950AA 7

Remove the hydraulic block discs **(21)** **(25)** one after the other.



LEIL12TLH0951AA 8

Remove the snap ring **(20)** that secures the planetary gear.

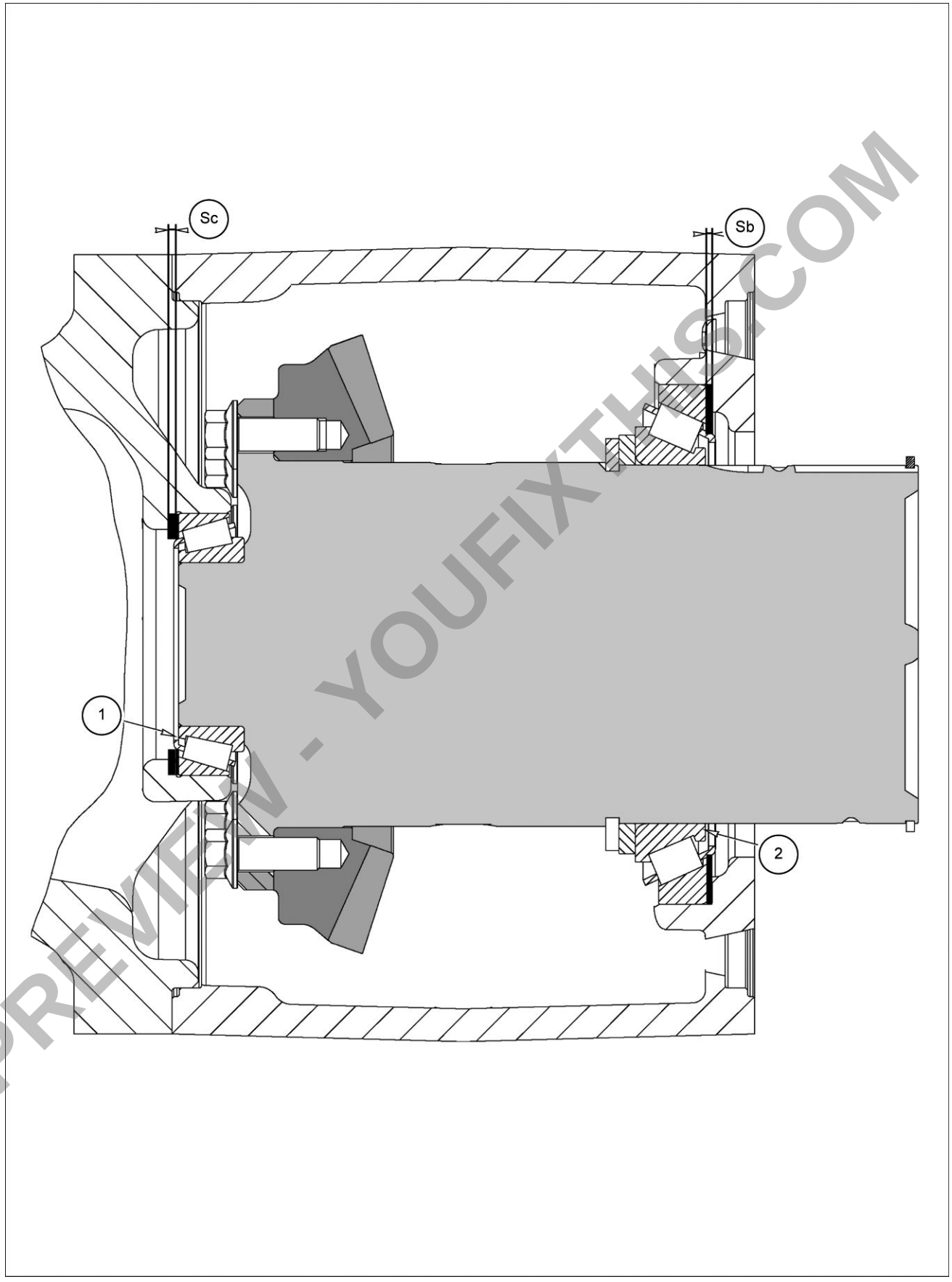


LEIL12TLH0952AA 9

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Axle pinion - Adjust



LEIL12TLH0902HA 1

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Brakes and controls - 33

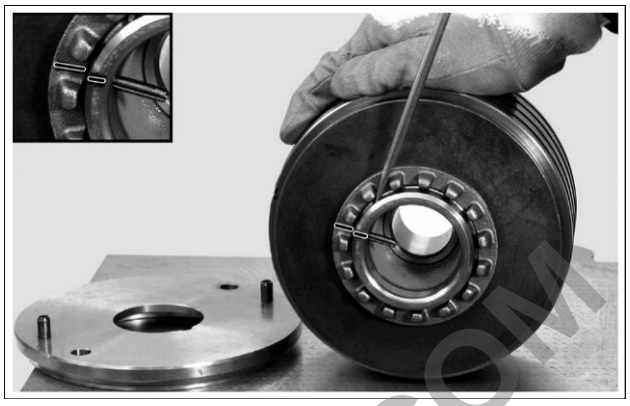
Mechanical service brakes - 120

LM5020
LM5030

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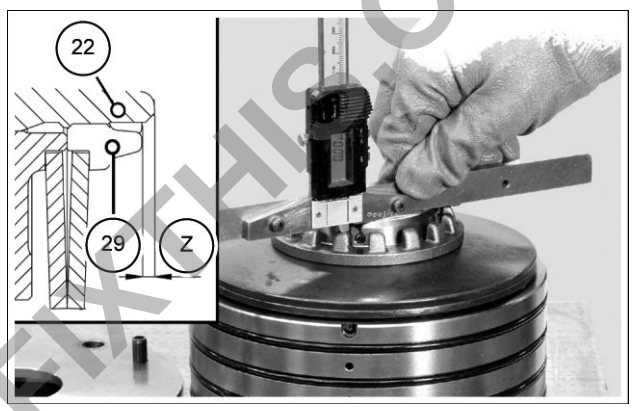
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Screw down the slotted nut to the earlier determined position.



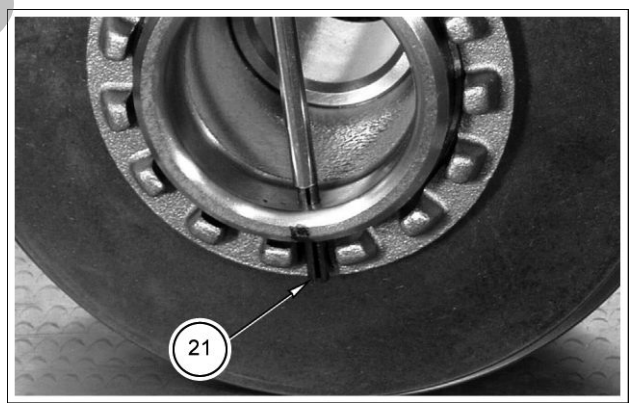
LEIL12TLH1501AA 34

Check the earlier measured distance Z from the plane to the tooth next to the pin.



LEIL12TLH1502AA 35

Put the pin in locking **(21)**position.



LEIL12TLH1503AA 36

Insert two screws of M12 to fix the break arm.

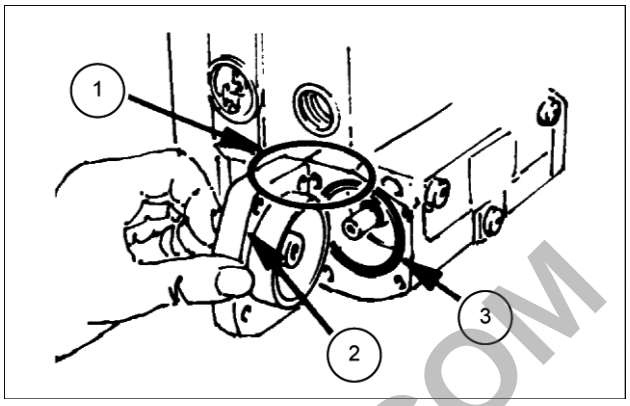


LEIL12TLH1504AA 37

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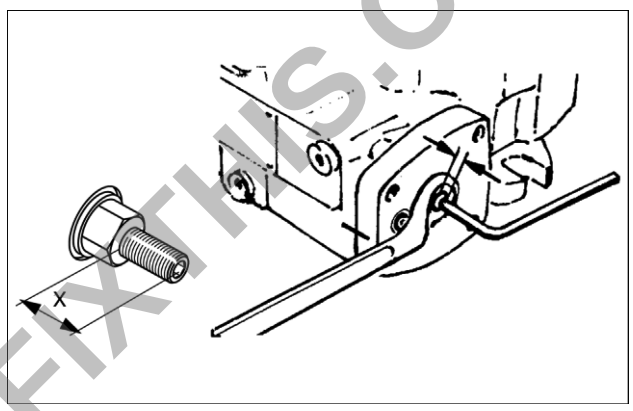
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Check:
O-ring **(1)**, groove **(2)**, housing **(3)**.



LEIL12TLH0420AA 3

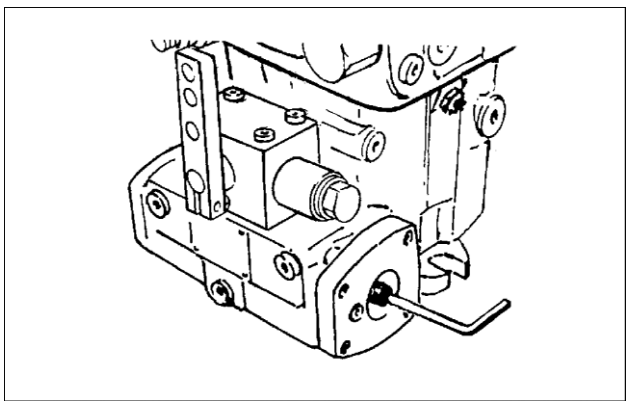
Remove locknut whilst holding setting screw.
Mark cover. Must be fixed, loosen counter nut.



LEIL12TLH0421AA 4

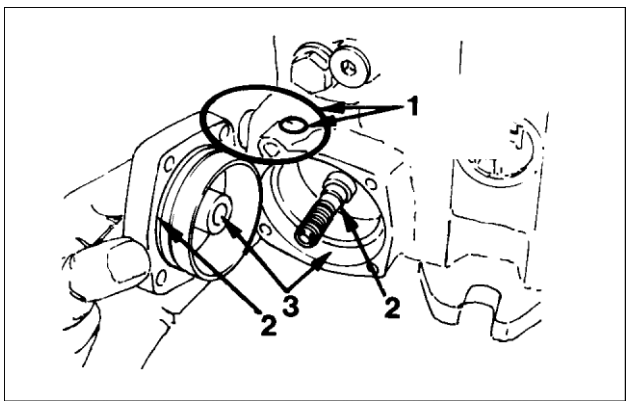
Sealing of the control piston cover

Pull cover off using zero position adjustment screw.



LEIL12TLH0422AA 5

Check:
O-ring **(1)**, groove **(2)**, housing **(3)**.

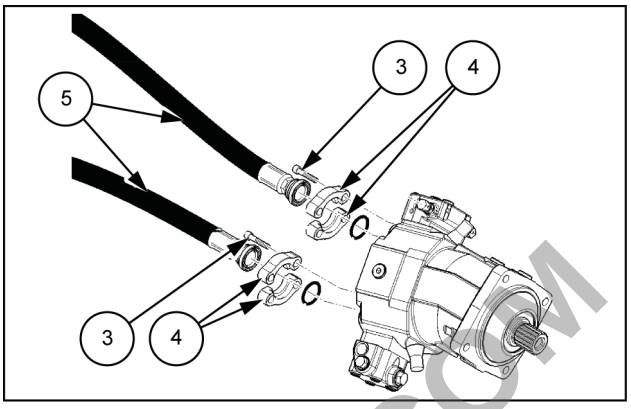


LEIL12TLH0423AA 6

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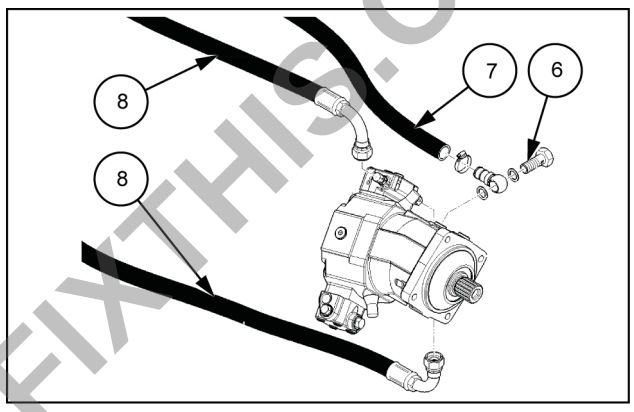
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Remove the four screws **(3)** and the two semi-flanges **(4)** to disconnect the two high pressure hoses **(5)**.



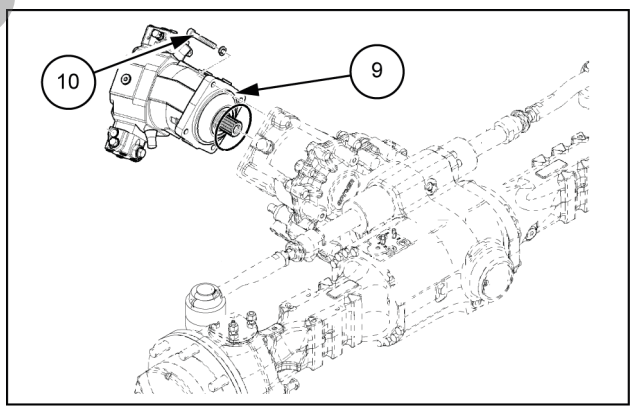
LEIL14TLH0723AB 4

Remove the screw **(6)** to disconnect the drain hose **(7)**. Disconnect the pilot hoses **(8)**, and the connection to the by-pass cock.



LEIL14TLH0724AB 5

Secure the hydrostatic motor **(9)** to a lifting equipment. Tighten slightly the slings of the lifting equipment. Remove the four allen screws **(10)** and the relevant washers which fasten the hydrostatic motor to the gearbox. Disconnect the hydrostatic motor of the gearbox and remove it from the machine.



LEIL14TLH0725AB 6

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Remove the ring nut of the extension cylinder rear pin using the appropriate equipment.



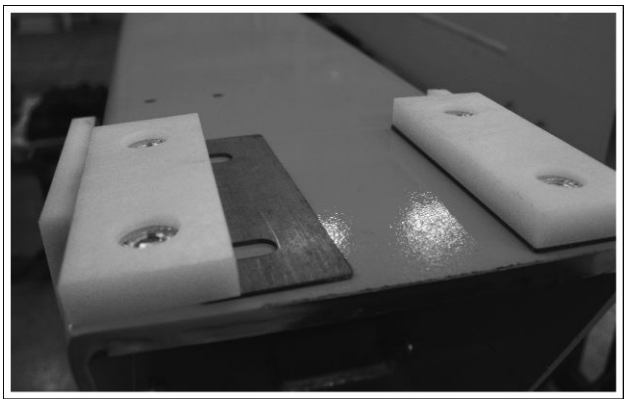
LEIL12TLH1616AA 44

Extract the pin from the opposite side paying attention to any side liners to be repositioned like in origin.



LEIL12TLH1617AA 45

Insert the new sliding blocks, in case of clearance greater than **2 mm**, insert the appropriate liners and fasten the screws at **8 kgm**.
Carry out the reverse operations of points 9, 8, 7, 6 and 5.



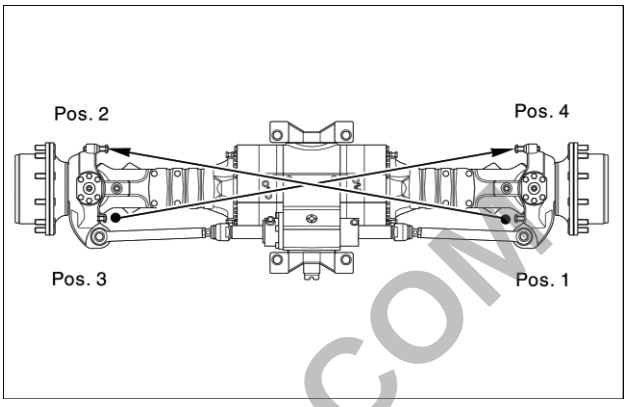
LEIL12TLH1618AA 46

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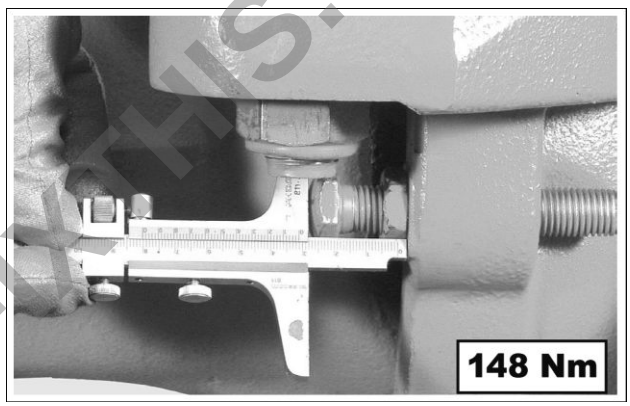
Steering cylinder - Adjust

NOTE: *Perform the same operations on both sides (see diagram). Loosen the nut of one of the adjusting screws on cylinder side.*



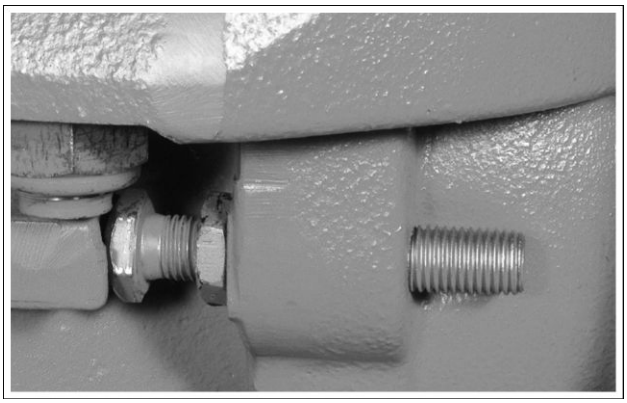
LEIL12TLH0772AA 1

Adjust the jutting portion of the screw according to data shown in the table. Lock into the position with nut tightened to max **148 N·m** (**109 lb ft**).



LEIL12TLH0773AA 2

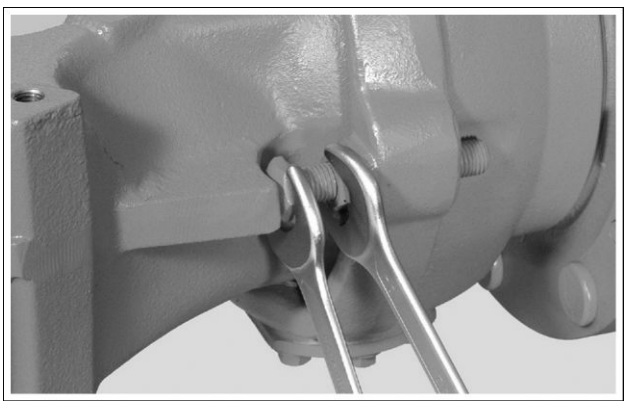
Perform one full steering operation until the adjusted screw leans against the arm stop.



LEIL12TLH0774AA 3

As you hold the adjusted screw in position against the arm stop, adjust the screw opposite, on non-cylinder side, until it leans against the arm stop.

NOTE: *The screws must lean against the respective arm stops all at the same time.*



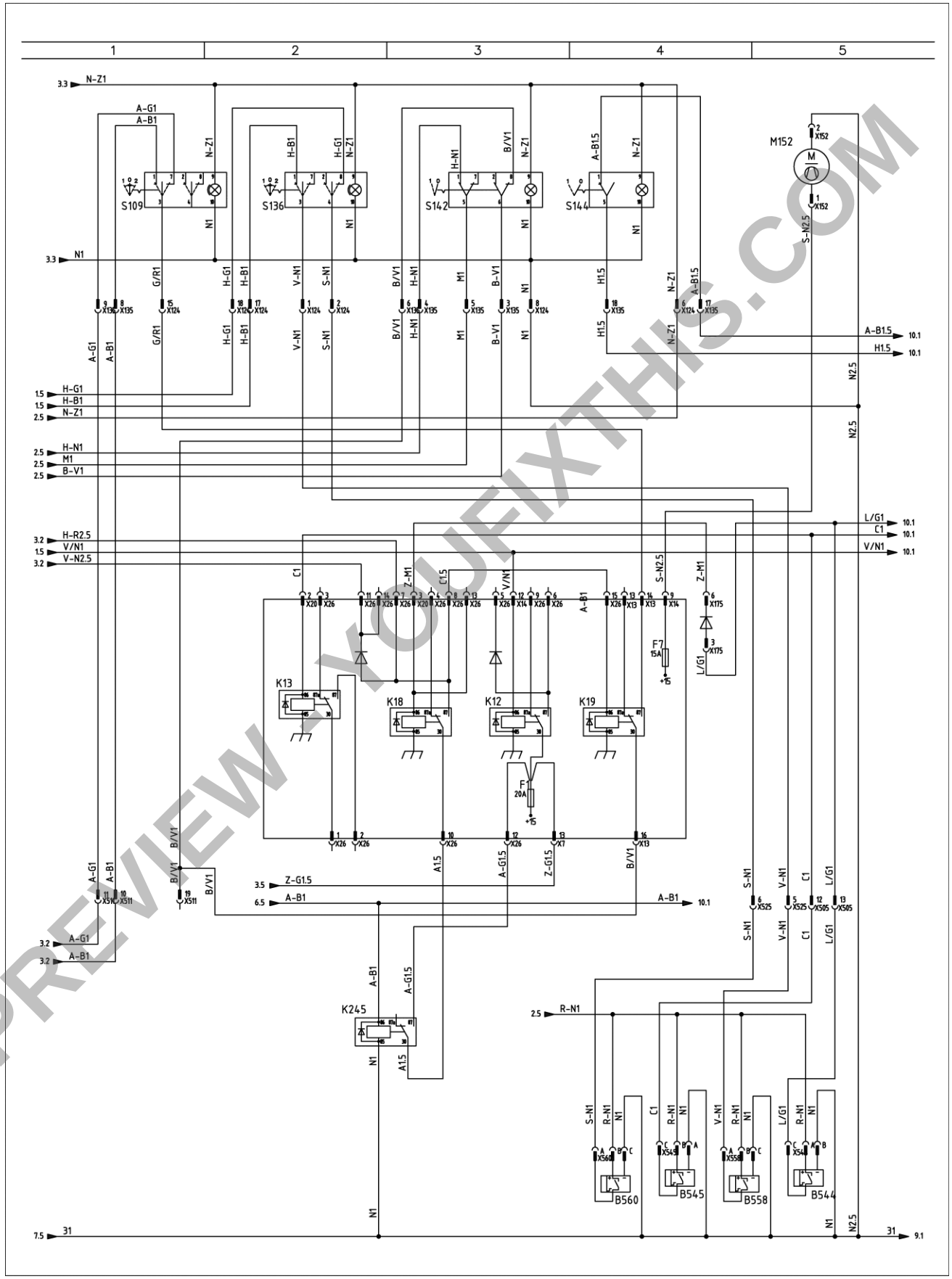
LEIL12TLH0775AA 4

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Wiring harnesses - Component diagram 09

LM5030	



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