



**OPERATING & MAINTENANCE
INSTRUCTIONS**

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OPERATING & MAINTENANCE INSTRUCTIONS TIPPER SCISSOR SYSTEM

1. INTRODUCTION

Before you use your tipper, you should familiarize yourself with the workings of this system. You should read this manual completely to ensure safe and effective use of this scissor wetkit. Unskilled use or poor maintenance can cause breakdowns and injuries.

In the event when service is required, we recommend that Hyva or an approved service agent carries out the work.

Hyva cannot accept any complaints or claims caused by unskilled use, poor maintenance and/or repairs.

We have continuous development programs to improve our products and it is possible that some design modifications have occurred that are not mentioned in this manual.

The advice given in this manual is by no means complete and should not be used as alternative to common sense.

1.1 Scope of use

Hyva declares that a scissor system wetkit consisting of oil tank, pump, valve, air control, adapters, couplings and mounting materials is seen as partly completed machinery.

This partly completed machinery is designed and constructed solely as a non-functional component to be incorporated into a machine requiring completion.

Our hydraulic system shall be connected to a trailer with a hydraulic tipping or moving floor system.

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1.2 General remarks

If you have any questions concerning the application, installation, operation or repair of any Hyva product - please contact your nearest Hyva Service Point.

1.2.1 Explanation of guidance



Warning of danger or attention to the operator or product. The operator can be seriously hurt or the equipment severely damaged if the recommended procedure is not followed.



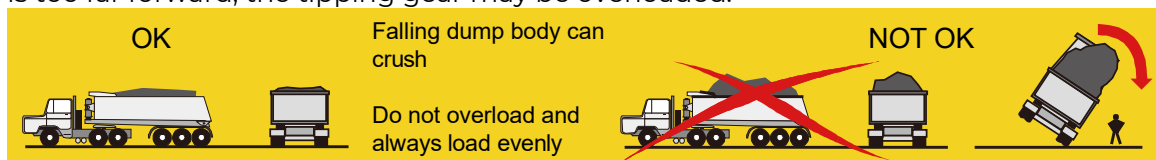
There is a serious threat to the life of the operator!

1.2.2 General precautions

Tipper operation can be a hazardous business and accidents can happen. So, to help you minimize the risk to you and your vehicle, always work within the following basic guidelines.

Loading

- Never stand in the body while the vehicle is loading or is parked in a loading area.
- Always fasten 'Rear doors' securely.
- Do not overload and ensure that the load is evenly distributed across the width of the body and front to back. This will help to prevent tip-over and ensure correct axle loading. If the load is too far forward, the tipping gear may be overloaded.



- Beware of loads which are likely to freeze, the load could freeze on one side.
- Beware of loads with varying densities. These loads may discharge unevenly, and instability occurs causing the truck to tip over.

Working site

- Deliver or collect loads only when and where the customer says it is safe to do so. Always report to a responsible person on arrival at the site and follow the site rules. If agreement cannot be reached, then consult your employer.
- Be on the lookout for obstructions especially overhead. *Do not* expect to have obstacles pointed out by site staff. Always look out for overhead power cables.



In the event the body (or vehicle) contacts overhead power cables:

- Leave the vehicle by jumping clear
- CALL THE EMERGENCY SERVICES IMMEDIATELY
- Do not make contact with the ground and the vehicle at the same time, this could complete the electrical circuit causing serious injury or death.
- Do not allow anyone to return to the vehicle before the electrical circuit is broken, and the electricity

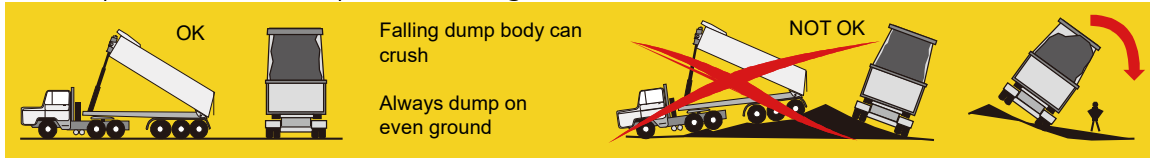
OPERATING & MAINTENANCE INSTRUCTIONS

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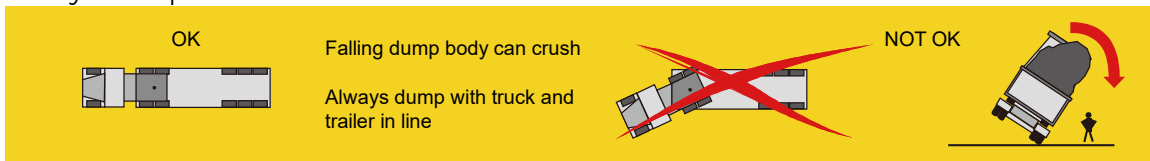
- Lower the body before attempting to clear any obstructions.
- Never tip if the working area is not properly illuminated.

Tipping

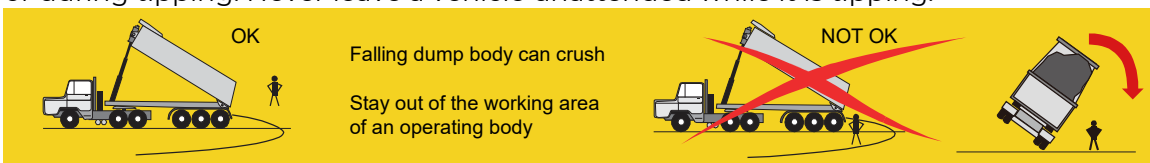
- Always make sure that the vehicle is on firm level ground both sideways and front to back. Where possible, do not tip while facing downhill. Make sure the vehicle remains level.



- Always dump with truck and trailer in line.



- Always ensure the taildoor is released prior to tipping. If the load is higher than the top of the taildoor, make sure the load cannot jam under the taildoor and the body could be forced over backwards by the weight of the load in the rear of the body.
- Beware of wind on one of the sides of the tipper. This wind on a great surface can cause the truck to tip over.
- Never stand or walk within the immediate working area of the vehicle when the body is tipped or during tipping. Never leave a vehicle unattended while it is tipping.



- Never drive with tipped dump body.



- If the load is not discharging when the body is tipped to about 25 degrees, (that is about halfway up) stop the tipper and investigate why the load is sticking. Keep well clear of the vehicle and load when walking to the rear.
- Do not 'rev' the engine excessively while tipping, as over-speed of the tipping pump can create oil starvation and seizure.
- If you think there is a danger of the vehicle falling over, stop the tipping operation and slowly lower the body and then investigate the cause.

Time taken preventing a topple-over is time well spent.

If the vehicle does begin to topple over:

- Stay in the truck, you are safer in the cab
- Brace yourself against the back of the driver seat
- Hold firmly onto the steering wheel
- Never try to jump out of a truck which is falling over

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- Ensure that the body is completely empty after discharge. Do not drive further than is necessary before the body is lowered and the taildoor re-secured. Do not 'shunt' the vehicle to discharge a sticky load.
- Never engage the PTO while the vehicle is in gear and ensure the pump is out of gear after tipping. Do not 'rev' the engine excessively while tipping, as over-speed of the tipping pump can create oil starvation and seizure.
- Never tip if there is any chance that the truck may topple over sideways or backwards.

Maintenance/Cleaning

- Choose a safe place to clean the body, never enter the body with engine on!
- Never go under a tipped body unless it is adequately propped. Lowering dump body can crush.



- Do not park vehicle with body tipped, but always completely lowered.

2. OPERATING INSTRUCTIONS

2.1 Components of the scissor tipping system

The hydraulic system typically consists of:

1. Oil tank
2. Pump
3. Hydraulic tipping valve
4. Air control for valve (to be mounted in cabin)
5. Hydraulic hoses low pressure
- 6-7-8 Hydraulic hose high pressure

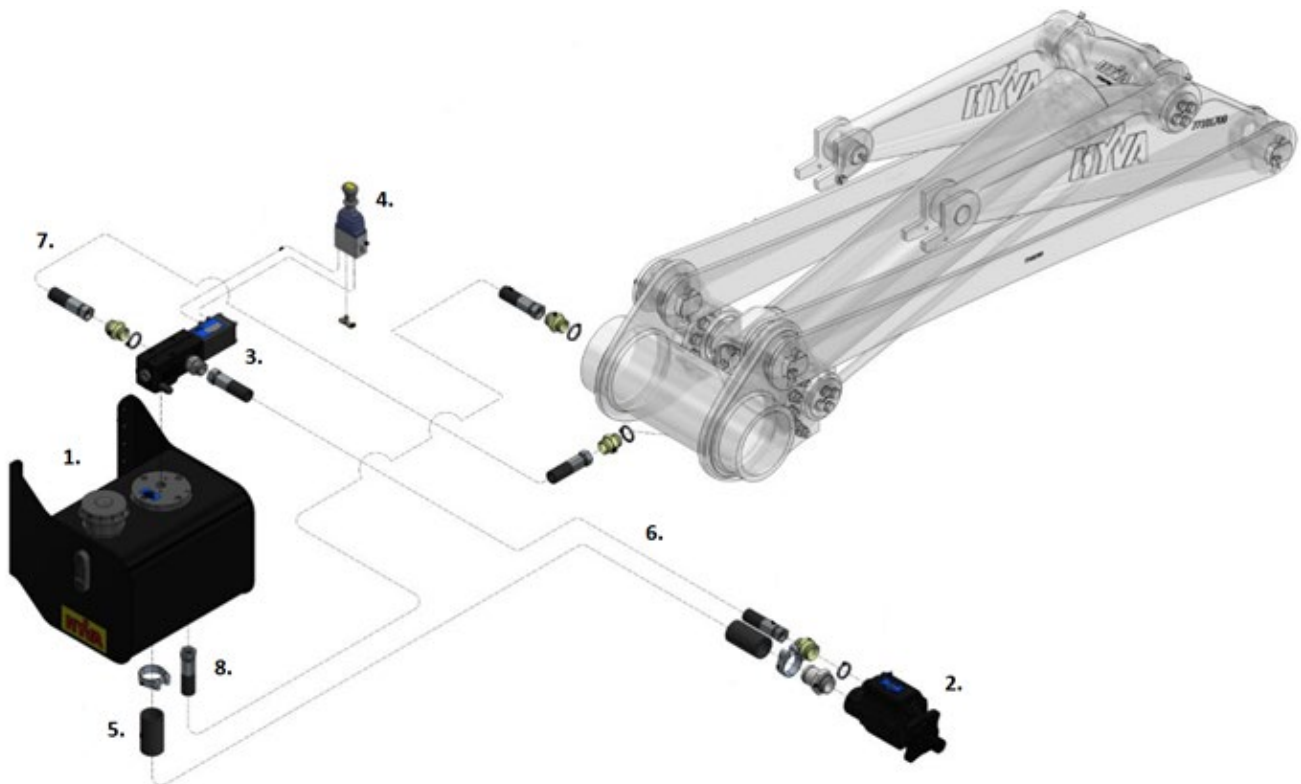


FIG. 2.1.1 EXAMPLE OF A HYDRAULIC TIPPER SCISSOR SYSTEM

2.2 Working pressure & oil tank volume

2.2.1 Working pressure Hyva tipping valve

Hyva has a range of tipping valves. Always check the 'working pressure' of the hydraulic system of the trailer. The Hyva wetkit may not exceed this pressure.

Hyva has tipping valves for different working pressures:

Standard single pressures

190 bar

220 bar

250 bar



FIG. 2.2.1 HT VALVE SINGLE PRESSURE

2.2.2 Oil tank volume (Hyva oil tanks)

Currently only one hydraulic oil tank is being used for the scissor system. Always check the requested 'oil working volume' of the scissor system. The Hyva oil tank should always have a bigger net volume than the requested oil volume.

The scissor system oil tank has a gross volume of 50 liters and a working volume of 35 liters.



FIG. 2.2.2 SCISSOR SYSTEM OIL TANK

2.3 Activating and controlling the tipping system

Control levers in the cab operate the tipper; the main controls are PTO and Air-(tipper) control.



FIG. 2.3.1 LOWERING POSITION

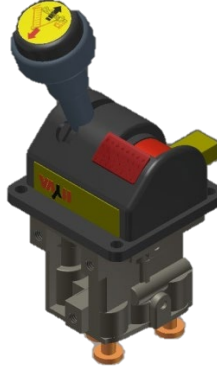


FIG. 2.3.2 NEUTRAL POSITION



FIG. 2.3.3 TIPPING POSITION

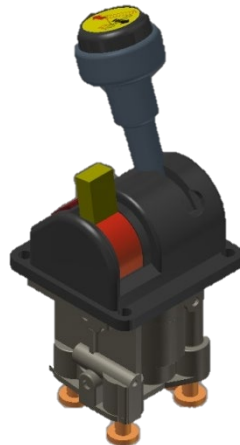


FIG. 2.3.4 PTO ON



FIG. 2.3.5 PTO OFF

2.3.1 PTO (Power Take Off)



If the truck manufacturer has mounted the PTO control, then consult the user manual of your truck.

The PTO 'takes power off' the engine (via the gearbox) to drive the pump and so the hydraulic system. Normally it is pneumatically (air-pressure) controlled and has two positions 0 and 1:

- fig. 2.3.4: 1 – "PTO on"
- fig. 2.3.5: 0 – "PTO off"

In the "engaged" position the PTO and pump are activated. A lamp on the control indicates the PTO is engaged.



The PTO must be disengaged when the tipper is not in use.

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I To engage the PTO

1. To stop the vehicle and apply the hand (parking) brake.
2. Put the gearbox in neutral.
3. Put the tipper-control valve in "neutral" position (see fig. 2.3.2).
4. Press the clutch and wait about 2 seconds.
5. Engage the PTO by moving the selector to "on / engaged" (see fig. 2.3.4).
6. Check if the indicator lamp illuminates and slowly release the clutch pedal.
7. The PTO is now engaged.



Do not drive with the P.T.O engaged.

II To disengage the PTO

1. With the tipper control in "neutral", press the clutch
2. Disengage PTO by switching the lever to the position "off / disengaged" (fig. 2.3.5). Check if the indicator lamp is off and slowly release the clutch
3. The PTO is now disengaged

2.3.2 Tipper (Air) control

The air-control pneumatically activates the tipping valve, which then controls the flow of oil. The air-control has three positions (see fig. 2.3.1, fig. 2.3.2, fig. 2.3.3);

fig. 2.3.1 - "Lowering";

fig. 2.3.2 - "Hold" or "Neutral"

fig. 2.3.3 - "Tipping"

I "Lowering"

When the selector is in "lower", hydraulic oil returns from the cylinder to the oil tank, because of the weight of the tipper body cylinder will be retracting and automatically the tipper body will be lowering.

II "Hold" or "Neutral"

In "neutral" the oil circulates (back to tank) and the cylinder is held in position.

III "Tipping"

Moving the selector to "tip", the hydraulic oil flows to the cylinder, extending the cylinder and raising the tipper body. Tipping can be interrupted at any time, by placing the air control in to "neutral".

2.4 Tipping the body

2.4.1 Rear tipping



Read and obey the instruction of the tipping trailer.

Make sure the hydraulic connections (quick release couplings) are connected correctly;

Before tipping check nobody is within the working area.

Tipping with a locked or blocked tail-door is a threat to life.

I To tip the body:

1. Remove any sheeting, it may block the tail door, restricting the discharge of the payload.
2. Release the taildoor locks, if not automatically opening while tipping.
3. Switch the air control valve into the “tip” position. (see chapter....).
4. Decrease engine rev when cylinder changes a stage.
5. Before cylinder reaches end of stroke decrease engine rev to stationary.
6. Switch the air-control to “neutral” at the end of the stroke (or when the ‘knock-off’ valve is reached).

II To lower the body:

1. Disengage the PTO (see chapter 2.3).
2. Switch the tipper control slowly into “lower”. The proportional control, tipping valve and tipper-control make it possible to control the lowering speed of the tipper body.
3. When the body has lowered and while driving off, allow about 5 minutes before switching the tipper control from “lowering” position to “neutral” position. This is necessary to assure that all cylinder stages will retract in the base, over the pull-out length.



High engine speeds may cause oil starvation, cylinder damage and pump damage.

DO NOT “shunt” the tipper body (drive with the body tipped and brake) – this can cause severe damage to the truck, body and hydraulics

Before driving, ensure that all locks and sheets are properly secured.

2.5 Tail-door locks

Your tipper may be fitted with a mechanically, pneumatically or hydraulically controlled tail-door lock. Mechanical locks automatically release when the body is tipped and engage when lowered. Pneumatically controlled doors operate in the same way as the PTO; 0 – locks secured; 1 – locks released.



Locks must be secured when the tipper is not in use.

3. MAINTENANCE INSTRUCTIONS

3.1 General

Before filling the oil tank, clean the filter to avoid contamination. Filling above the maximum level can lead to overflow. If the vehicle is expected to be out of use for a long period, grease all turning points to avoid seizure.



Maintenance near or on rotating parts is dangerous

3.1.1 Hydraulic oil

To avoid any damage to the hydraulic system we recommend hydraulic oil with a viscosity (at 40°C) of between 75 and 12 mm²/sec. The maximum temperature of the oil must not exceed 80°C.

Hyva maintains a list of recommended oils (OIL-0011). Please contact your nearest Hyva service point or visit our website (www.hyva.com). Equivalent oils from other suppliers can be used.

For continuous cleaning of your hydraulic oil Hyva recommends using the Hyva hydraulic oil return filter.

3.1.2 After a collision

Check the hydraulic system for damage (particularly suction hose, oil tank, and connections between pump & PTO). Check all pneumatic and hydraulic connections for damage and leaks.

When there is any doubt do not tip the vehicle until a Hyva agent or service station has checked it.

3.2 Maintenance

In addition to the maintenance schedule, Hyva recommends a daily, walk-round, visual inspection for safety purposes, this time can be used to catch maintenance early saving money and breakdowns.

Points to check are:

1. Wheels – check tyres are safe and legal, all nuts are tightened (tap with a spanner, loose nuts sound dull). Check double tyres for trapped objects that can become projectiles whilst driving.
2. Chassis & Superstructure – check for general condition, cracks & other signs of wear, the fit of closures & turning points and mounting points for equipment (i.e. cylinder).
3. Air Lines (brakes) & Hydraulics – check pressures & levels and listen for escaping air & watch for oil drops on and under the truck.

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3.3 Greasing points scissor system

Grease all rotation points daily by 60 cycles per day.

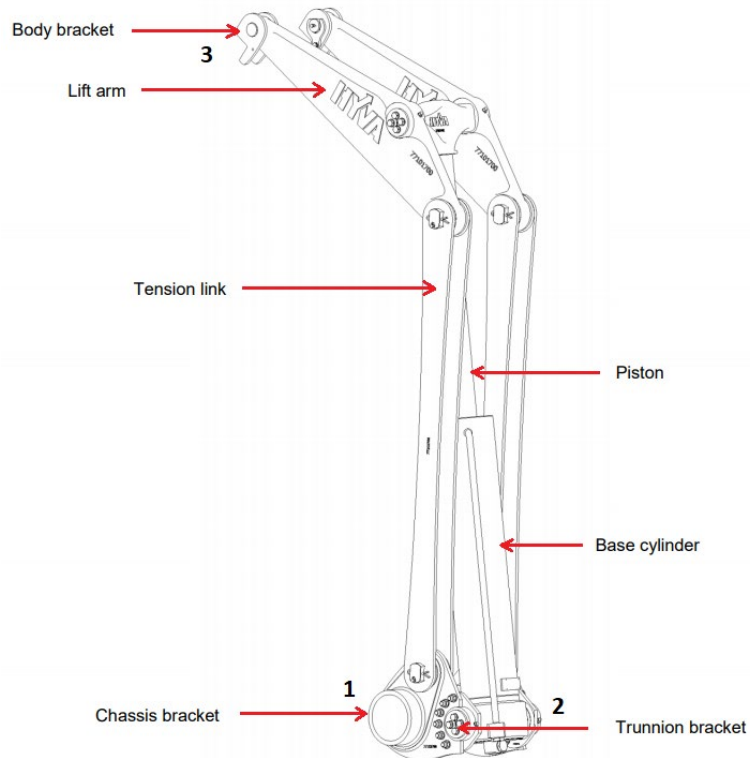


FIG. 3.3.1 SCISSOR SYSTEM PARTS



FIG. 3.3.2 GREASING POINTS SCISSOR SYSTEM

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3.3.1 Maintenance Checklist – Standard Application – (10 cycles/day)

Maintenance Intervals	Task	✓
Daily	Check air hoses : damages & leaks	
	Check knock-off : operation, damages & leaks	
	Check air control : operation, damages & leaks	
	Check cylinder : operation, damages & leaks	
	Check hydraulic hoses : damages & leaks	
	Check Hydraulic valvE : damages & leaks	
	Check Tank : damages & leaks	
	Check oil level in the oil tank. Oil level has to be in the middle of the spy eye or level indicator, while body is resting on the sub frame.	
Weekly wetkit	Clean outside of cylinder ⁽¹⁾	
	Check “leak indicator” hole of pump for oil	
	Check oil return filte for dirt	
	Check air breather filter for dirt	
	Check nut and bolt (torques)	
Weekly scissor	Grease chassis brackets of cylinder (1) ⁽²⁾	
	Grease trunnion bracket (2) ⁽²⁾	
	Grease body bracket (3) ⁽²⁾	
	Grease rear hinges of body	
	Grease tail door mechanism	
	Grease Hyfix body clamp	
	Grease stabilizer pivot points	
Every 6 months	Change oil return filter	
	Change air breather filter	
Annually	Change oil and make sure tank is clean	

(1) DO NOT use a steam cleaner when cleaning hydraulics .When using pressurized cleaner, water temperature should be below 40°C.
(2) Greasing for lubrication is only required regularly in greased bearings. Hyva maintenance free bearings require grease for easy installation and not for lubrication. Suitable types of grease are: Hyva packset grease, Molykote G-4500, Dinitrol Paste and Shell Ensys.

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3.3.2 Maintenance Checklist – Mining Application – (60 cycles/day)

Maintenance Intervals	Task	✓
Daily wetkit	Check air hoses : damages & leaks	
	Check knock-off : operation, damages & leaks	
	Check air control : operation, damages & leaks	
	Check cylinder : operation, damages & leaks	
	Check hydraulic hoses : damages & leaks	
	Check Hydraulic valve : damages & leaks	
	Check Tank : damages & leaks	
Daily scissor	Check oil level in the oil tank. Oil level has to be in the middle of the spy eye or level indicator, while body is resting on the sub frame.	
	Grease chassis brackets of cylinders (1) ⁽²⁾	
	Grease trunnion bracket (2) ⁽²⁾	
	Grease body bracket (3) ⁽²⁾	
	Grease rear hinges of body	
	Grease tail door mechanism	
	Grease Hyfix body clamp	
Weekly	Grease stabilizer pivot points	
	Clean outside of cylinder ⁽¹⁾	
	Check “leak indicator” hole of pump	
	Check oil return filter	
	Check air breather filter	
Every 2 months	Check nut and bolt (torques)	
	Change oil return filter	
Annually	Change air breather filter	
	Change oil and make sure tank is clean	

(1) DO NOT use a steam cleaner when cleaning hydraulics .When using pressurized cleaner, temperature should be below 40°C.
(2) Greasing for lubrication is only required regularly in greased bearings. Hyva maintenance free bearings require grease for easy installation and not for lubrication. Suitable types of grease are: Hyva packset grease, Molykote G-4500, Dinitrol Paste and Shell Ensys.



Apart from the schedule, Filter and Breather elements need to be replaced whenever hydraulic oil is changed.

These are basic maintenance recommendations and each company should develop their own maintenance program schedule that meets their operational procedures if required.

3.4 Fill/refilling oil tank

3.4.1 Process flow for fill/refilling oil tank

Process flow:

1. Check if there are no leakages on tank or adapters;
2. Remove air breather filter;
3. Fill oil tank with recommended hydraulic oil till you reached allowed filling level according to 3.3.2;
4. Bleed pump;
5. Switch on system;
6. Switch off system and wait 2 minutes;
7. Check if filling level is still correct according to 3.3.2 If this is not correct refill tank, till you reached allowed filling level according to 3.3.2;
8. Clean surface around filling place.

3.4.2 Minimum allowed oil filling level

Side mounted oil tank:

- Fill the tank with the recommended hydraulic oil to the centre of the spy glass (level indicator)
- Measuring must be done when:
 - Cylinder is completely retracted;
 - System is switched off for more than 2 minutes.

3.5 Hydraulic & pneumatic diagram

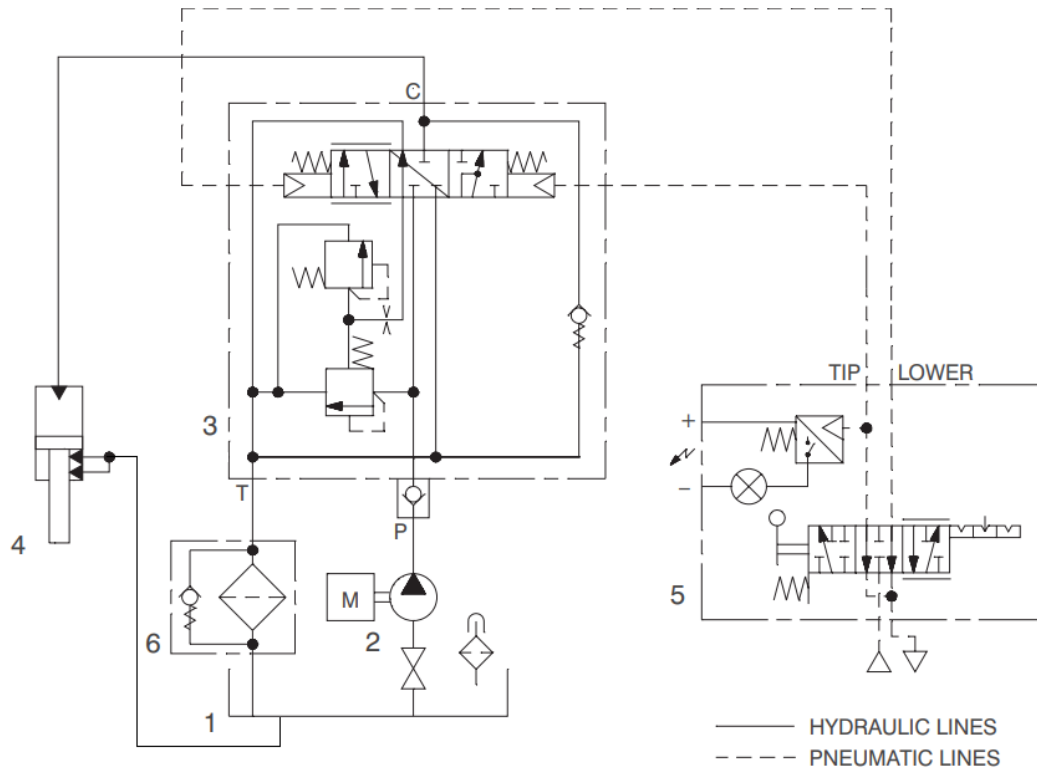


FIG. 3.5.1 HYDRAULIC AND PNEUMATIC DIAGRAM FOR SCISSOR SYSTEM

Pos.	Description	Qty.
1	Oil tank	1
2	Pump	1
3	Tipping valve	1
4	Cylinder	1
5	Air control	1
6	Return line filter	1

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4. CONTACT HYVA

In case you have any questions concerning application, installation, warranty, operation or repair of any Hyva product: Please contact your nearest Hyva Service Partner and check the Hyva website (both for documentation as for service partner coordinates).

www.hyva.com