



**OPERATING & MAINTENANCE
INSTRUCTIONS**

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OPERATING & MAINTENANCE INSTRUCTIONS TIPPER FRONT-END/UNDERBODY

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 the tipper. Unskilled use or poor maintenance of tippers often causes 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 and/or to the tipper due to 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.

If you follow the guidelines in this manual, we are certain that you will enjoy many years of safe and efficient use from your tipper

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

The Hyva tipper has been developed only for use in non- explosive, above ground, environments and for the transport and tipping of payloads except for perishable food-ingredients.

This manual is intended to give you clear, accurate information for the operation and maintenance of your Hyva tipper. We recommend keeping this manual in the truck cab for future reference.

The Hyva cylinder range includes front-end cylinders with outer cover (FC), with eye (FE) and with eye/eye (FEE/FSE) and under body cylinders for 3-way tipping (KR/UM/UL).

OPERATING & MAINTENANCE INSTRUCTIONS

TIPPER FRONT-END/UNDERBODY

1.2 General remarks

Specification sheets are available for all Hyva cylinders; these sheets contain all relevant dimensional and application information about your cylinder.

The Hyva cylinder has been developed for lifting purposes only and its use for any other purpose is prohibited. The cylinder is not to be used as a stabilizer and any kind of side-load must be avoided whenever possible.



Applying side-load to any cylinder is dangerous.

The cylinder should be mounted with a minimum pull out of 15 mm and a maximum pull out of 50 mm (the closed length of the cylinder on the Hyva specification sheet already includes 20 mm pull out).

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.



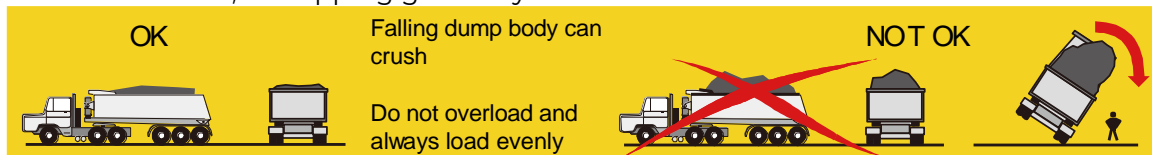
There is a serious threat to the life of the operator!

1.2.2 General precautions

Tipper operation can be a hazardous business and accidents can happen. So to help you minimise 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.

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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.



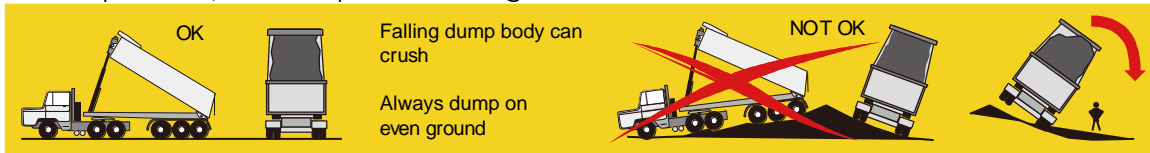
In the event the body (or vehicle) contacts overhead power cables:

- 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 discharged.

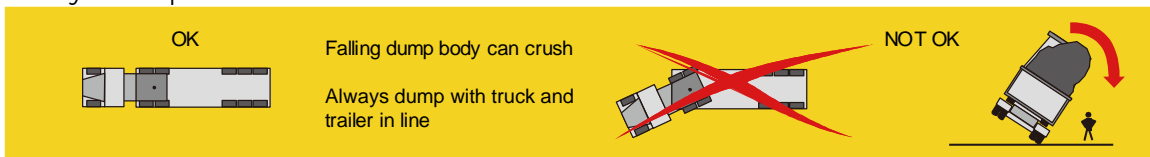
- Lower the body before attempting to clear any obstructions.
- Never tip if the working area is not properly illuminated.

Tipping

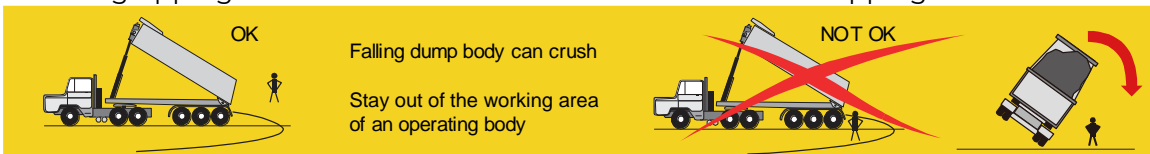
- Always make sure that the vehicle is on firm level ground both sideways and front to back. Where possible, do not tip while facing downhill. Make sure the vehicle remains level.



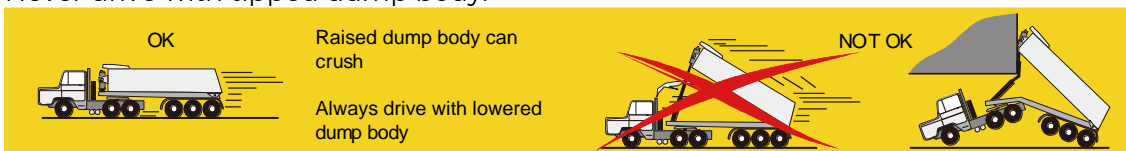
- Always dump with truck and trailer in line.



- 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.



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- 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

- 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

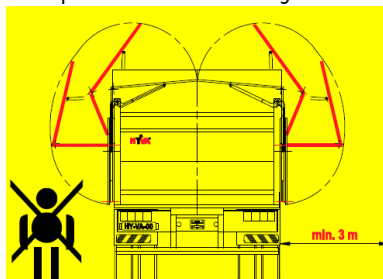
- Choose a safe place to clean the body, never enter the body with engine on!
- Never go under a tipped body unless it is adequately propped. Lowering dump body can crush.



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

Multicap

- Only access the body when truck engine is off and with Multicap completely opened.
- It is prohibited to stay within the working area of the Multicap.



2. OPERATING INSTRUCTIONS

2.1 Components of the tipping system

The truck mounted, tipping system usually consists of:

- Subframe (not used in all countries)
- Tipper body (with hinge assembly)
- Hydraulic system.

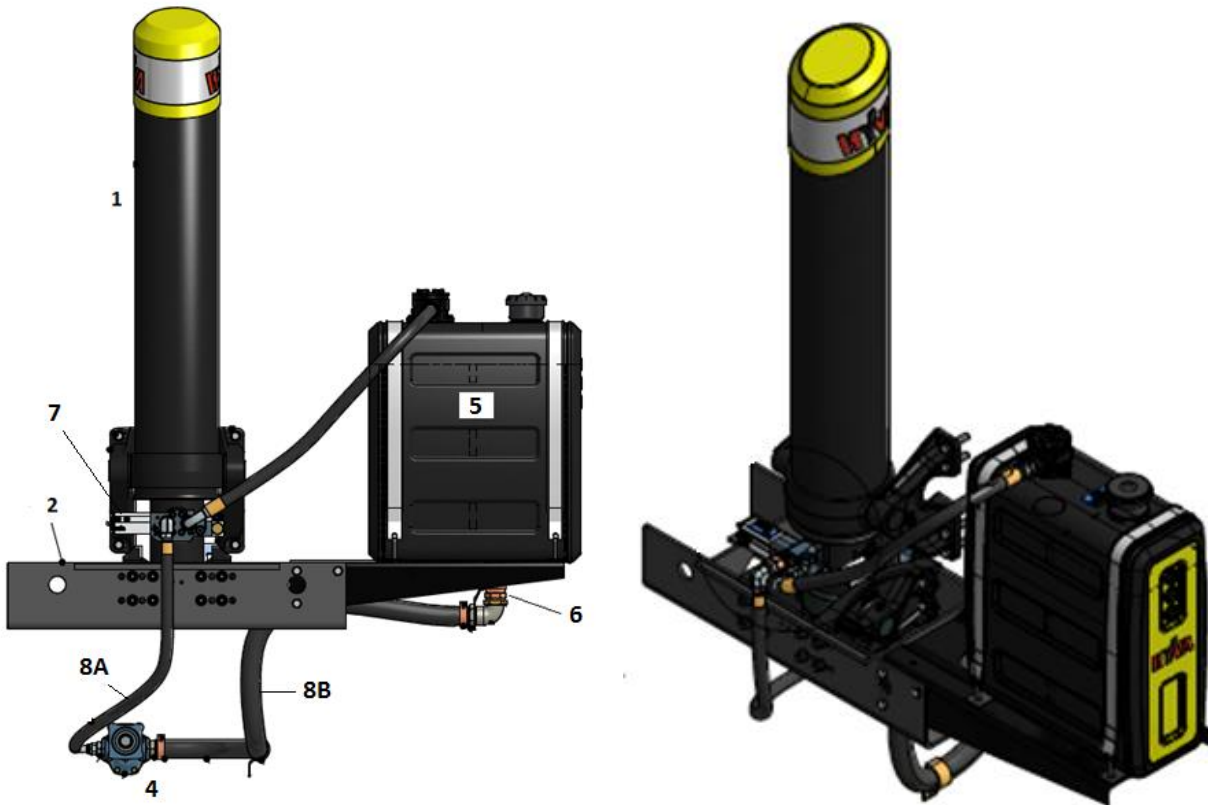


FIG. 2.1.1 EXAMPLE OF A HYDRAULIC SYSTEM

The hydraulic system typically consists of:

- | | |
|---|-------------|
| 1. Hydraulic cylinder | |
| 2. Cylinder cradle | |
| 3. PTO | (Not shown) |
| 4. Pump | |
| 5. Oil tank | |
| 6. Ball Valve | |
| 7. Hydraulic tipping valve | |
| 8. A. Hydraulic hoses high pressure | |
| B. Hydraulic hoses low pressure | |
| 9. Cab mounted air control for P.T.O. & valve | (Not shown) |
| 10. Pneumatic knock off valve | (Not shown) |

2.2 Activating and controlling the hydraulic system

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



FIG. 2.2.1 LOWERING POSITION



FIG. 2.2.2 HOLD OR NEUTRAL POSITION



FIG. 2.2.3 TIPPING POSITION



FIG. 2.2.4 PTO ON



FIG. 2.2.5 PTO OFF

2.2.1 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. 2.2.4: 1 – "PTO on"
- fig. 2.2.5: 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.

I To engage the PTO

1. 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. 2.2.2).
4. Press the clutch and wait about 2 seconds.
5. Engage the PTO by moving the selector to “on / engaged” (See fig. 2.2.4)
6. Check 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 Disengaging 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. 2.2.5).
3. Check the indicator lamp is off and slowly release the clutch.
4. The PTO is now disengaged.

2.2.2 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. 2.2.1, fig. 2.2.2, fig. 2.2.3);

fig. 2.2.1 – “Lower”

fig. 2.2.2 – “Hold” or “Neutral”;

fig. 2.2.3 – “Tip”;

I “Lower”

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 “Tip”

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”.

2.3 Tipping the body

2.3.1 Rear tipping

DANGER

Before tipping check nobody is within the working area.

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

For 2 & 3 way tippers: Unsecured hinge pins are 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. When your tipper is fitted with a Hyva *Multicap* consult the user manual prior to tipping.
3. For 3-way tippers only: Check both hinge pins are in the rear hinge brackets. If not, then swap one of the front hinge pin to the rear hinges.
4. Release the tail door locks, if not automatically opening while tipping.

5. Engage the PTO (see chapter 2.2).
6. Fully deflate the air suspension if equipped.
7. Switch the air control valve into the “tip” position (see chapter 2.2).
8. Decrease engine rev when cylinder changes a stage.
9. Before cylinder reaches end of stroke decrease engine rev to stationary.
10. Switch the air-control to “neutral” at the end of stroke (or when the ‘knock-off’ valve is reached).

II To lower the body:

1. Disengage the PTO (see chapter 2.2).
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 1 minute 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.

2.3.2 Side tipping (2- & 3-way tippers)

Here the tipper can discharge its load to one or both sides of the vehicle.

I To tip the body:

1. Control if at the front and rear in the direction you want to tip a hinge pin is present.
2. Release the side wall locking's and open the side walls 90° degree or further.
3. The body can now be tipped in the same manner as a rear tipper.

II To lower the body:

1. Disengage the PTO.
2. Switch the control of the body slowly to "lower". The proportional air control and the Hyva tipping valve allow to control the speed of this movement.
3. When the body is completely lowered and you're driving away, you're required to wait 1 minute to put the control from "lowering" to "neutral". This is necessary to make sure that all the cylinder stages are returned to the base.



Unsecured hinge pins are a threat to life.

When side tipping, the side wall overhang may not exceed 80 cm (2ft. 3in.). Too much 'overhang' may tip the vehicle over.

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

The two hinge pins should never be mounted in diagonal position with regards to each other.

2.4 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 Precautions



Maintenance near or on rotating parts is dangerous

If the tipping body is tipped for maintenance purposes, it must be securely propped.

It is danger to life to work on or under an un-propped body.



Follow the steps before maintenance:

When the sub frame is fitted with body props you can use the props to work safe under a tipped body. For maintenance under the body take the following steps:

1. Switch on the PTO and tip the body as far as possible
2. Put the cab control in neutral position and switch off the PTO
3. Place the left and right prop in standing position.
4. Lower the body careful and check if the props are well fitted in to the determined places of the body.
5. Put the cab control in neutral position when the body lays on the props.

Follow the steps after maintenance:

1. Remove all tools and parts under the body!!
2. Switch on the PTO and tip the body as far as possible
3. Put the cab control in neutral position and switch off the PTO
4. Place the right and left prop back in horizontal position
5. Lower the body by use of the cab control.



3.1.1 Hydraulic oil.

For hydraulic oil recommendations refer to document OIL-0011. If the document isn't available, please contact your nearest Hyva service partner or visit our website (www.hyva.com). Equivalent oils from other suppliers can be used.

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.

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

3.1.3 Out of use

If the vehicle is expected to be out of use for a long period, grease all turning points to avoid seizure.

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3.2 Maintenance

In addition to the maintenance schedule, Hyva recommends a daily visual inspection of your tipping vehicle for safety purposes. This will help in spotting any potential problems early which will save money and prevent 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.

3.3 Maintenance schedule

The wetkit maintenance schedule below includes the items to be regularly checked and inspected with a recommended time schedule.

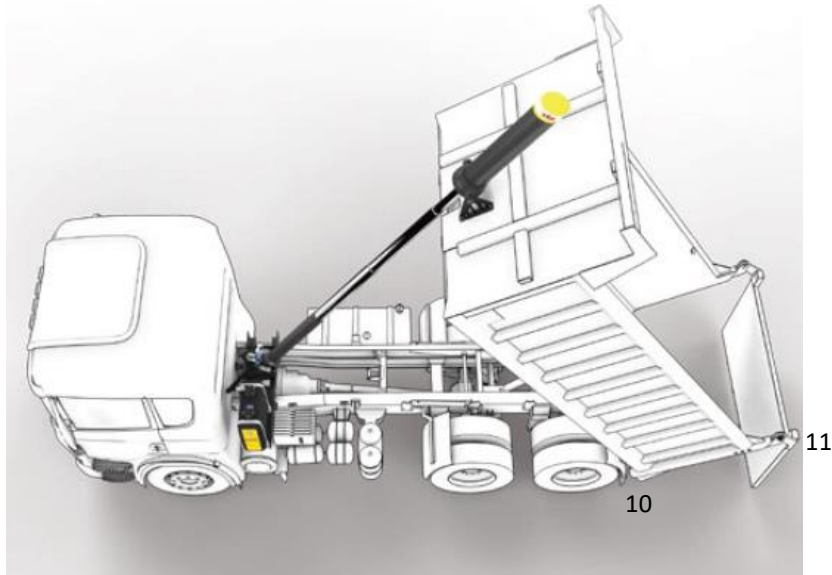


FIG. 3.3.1 VEHICLE IN TIPPED POSITION

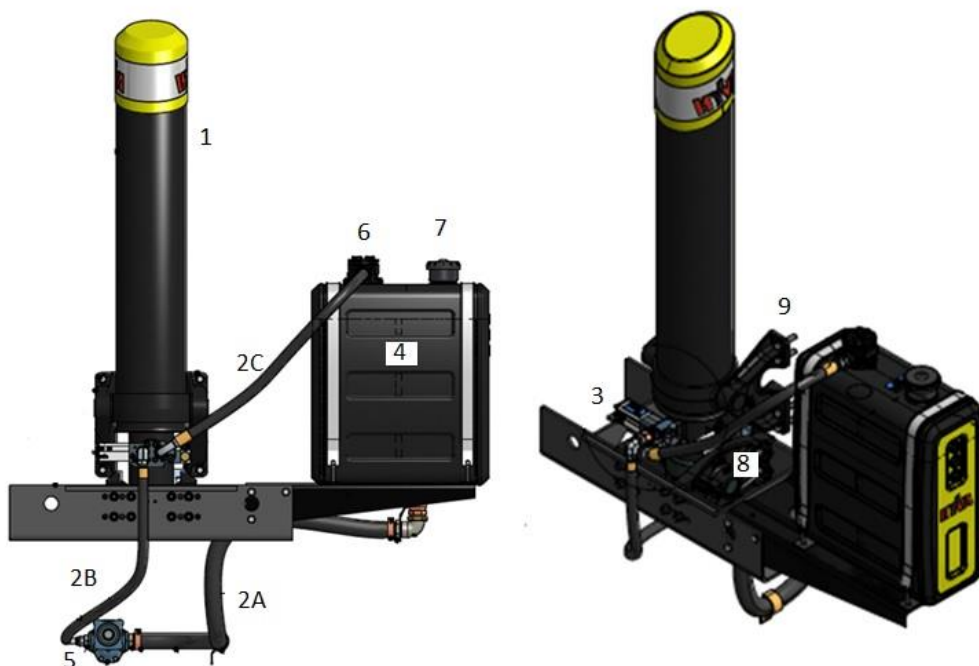


FIG. 3.3.2 WETKIT FOR TIPPERS (FC TYPE CYLINDER)

OPERATING & MAINTENANCE INSTRUCTIONS TIPPER FRONT-END/UNDERBODY

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 (1) : operation, damages & leaks	
	Check hydraulic hoses (2A,B,C) : damages & leaks	
	Check Hydraulic valve (3) : damages & leaks	
	Check Tank (4) : 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	Clean outside of cylinder ⁽¹⁾	
	Check “leak indicator” hole of pump (5) for oil	
	Check oil return filter (6) for dirt	
	Check air breather filter (7) for dirt	
	Check nut and bolt (torques)	
	Grease chassis brackets (8) of cylinders ⁽²⁾	
	Grease lifting brackets (9) : FC types ⁽²⁾	
	Grease piston eye on tipper body : FE/FEE/FSE types ⁽²⁾	
	Grease ball cup for piston : KR/UM/UL types	
	Grease cradle : KR/UM/UL types	
	Grease rear hinges (10) of body	
	Grease front hinges 3-way tippers only	
	Grease tail door mechanism (11)	
Grease Hyfix body clamp		
Grease stabilizer pivot points		
Every 6 months	Change oil return filter	
	Change air breather filter	
	Check top nut, located underneath the dust cover, if the top nut washer has any play: replace the top nut by a new one and apply the recommended torque of 800Nm minimum.	
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 Ensyl.

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

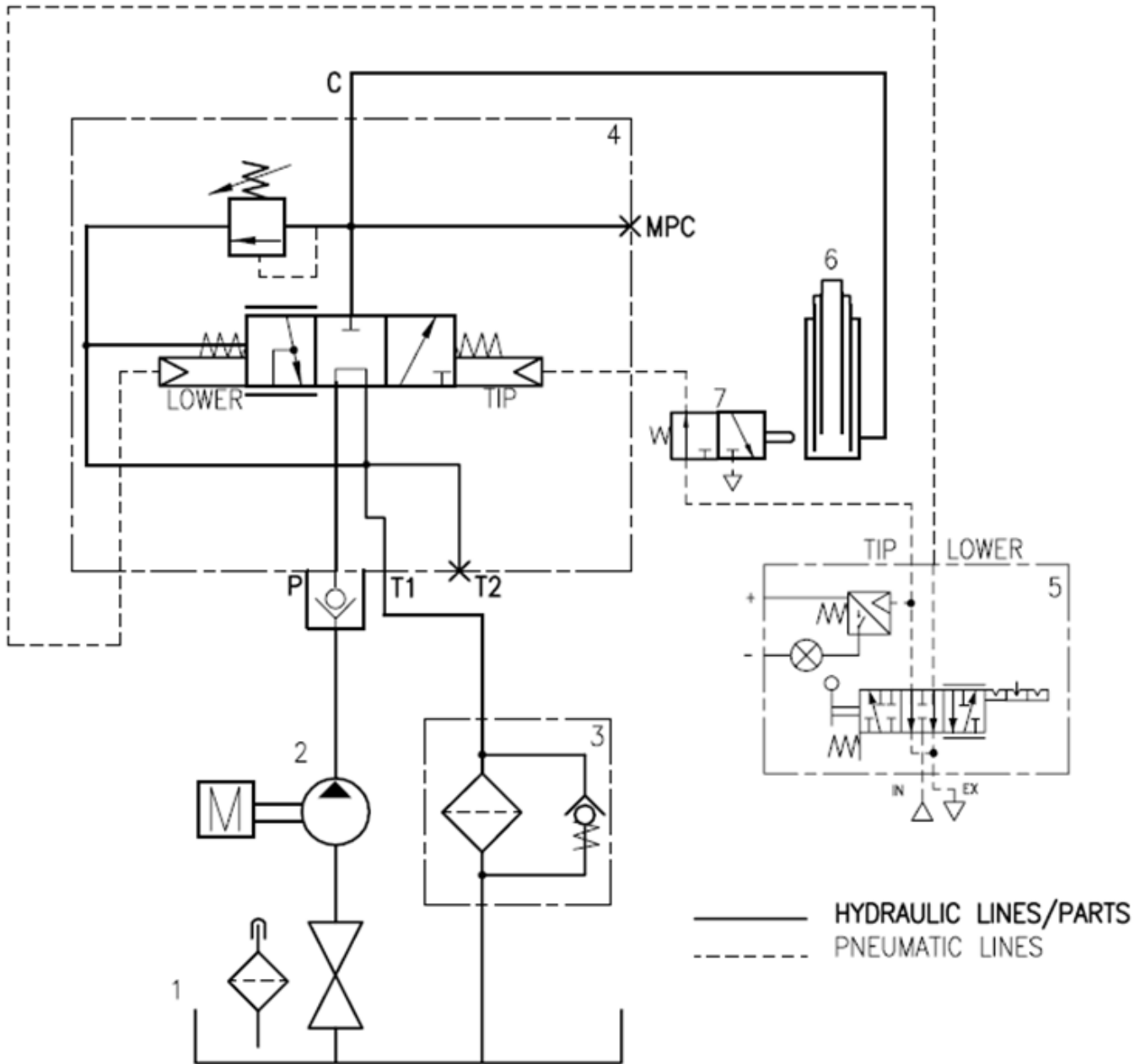
Maintenance Intervals	Task	✓
Daily	Check air hoses : damages & leaks	
	Check knock-off : operation, damages & leaks	
	Check air control : operation, damages & leaks	
	Check cylinder (1) : operation, damages & leaks	
	Check hydraulic hoses (2A,B,C) : damages & leaks	
	Check Hydraulic valve (3) : damages & leaks	
	Check Tank (4) : 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.	
	Grease chassis brackets (8) of cylinders ⁽²⁾	
	Grease lifting brackets (9) : FC types ⁽²⁾	
	Grease piston eye on tipper body : FE/FEE/FSE types ⁽²⁾	
	Grease ball cup for piston : KR/UM/UL types	
	Grease cradle : KR/UM/UL types	
	Grease rear hinges (10) of body	
	Grease front hinges : 3-way tippers only	
	Grease tail door mechanism (11)	
Grease Hyfix body clamp		
Grease stabilizer pivot points		
Weekly	Clean outside of cylinder ⁽¹⁾	
	Check "leak indicator" hole of pump (5)	
	Check oil return filter (6)	
	Check air breather filter (7)	
	Check nut and bolt (torques) Check top nut, located underneath the dust cover, if the top nut washer has any play: replace the top nut by a new one and apply the recommended torque of 800Nm minimum.	
Every 2 months	Change oil return filter	
	Change air breather filter	
Annually	Change oil and make sure tank is clean	
<p>(1) DO NOT use a steam cleaner when cleaning hydraulics .When using pressurized cleaner, temperature should be below 40°C.</p> <p>(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 Ensyl.</p>		



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 Hydraulic & pneumatic diagram



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

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4. TROUBLE SHOOTING

Fault	Causes	Action
Cylinder does not extend when the air control is in "tip".	<p>PTO not engaged. No oil in tank. Ball valve below oil tank closed or suction line blocked. Safety ball valve is closed Low air pressure or line blocked Knock off valve not functioning. Cylinder connected to wrong valve port. Quick detachable coupling is not good connected.</p>	<p>Engage PTO. Fill oil tank with hydraulic oil. Open ball valve.</p> <p>Open safety ball valve Increase pneumatic pressure. Contact your Service station or HYVA dealer. Tighten these couplings.</p>
Tipping valve does not function (air pressure present).	Tipping valve fault.	Contact your service station or Hyva dealer.
Cylinder extends too slow.	<p>Air pressure too low. Faulty pump. Faulty relief valve.</p>	<p>Check pneumatic pressure (min. 6 bar, 87 PSI). Contact your service station or Hyva dealer.</p>
Cylinder does not extend smoothly (after 3 or 4 tips).	<p>Oil level in tank too low. Air in the oil. Faulty pump.</p>	<p>Fill oil tank (3.3)</p> <p>Contact your service station or Hyva dealer. Contact your Service station or HYVA dealer.</p>
Cylinder does not fully extend.	<p>Oil level in tank too low. Oil circulating via the relief valve, (excess or uneven load). Faulty relief valve. Overloaded</p>	<p>Fill oil tank (3.3) Manually remove or redistribute the payload. Contact your service station or Hyva dealer. Partly unload</p>
Body lowers when the clutch is pressed.	The non return valve in tipper valve not functioning (or fitted).	Contact your service station or Hyva dealer.
The cylinder extends when the air control is in "lower".	Pneumatic hoses are reversed at the tipping valve or air control.	Contact your service station or Hyva dealer.
The cylinder does not lower properly (or too fast/slow).	<p>Return filter (oil) is blocked. The lowering speed adjustment is too low or too high. 'Knock-off' valve not functioning. Air control not functioning. Oil is too thick.</p>	<p>Change oil filter.</p> <p>Contact your service station or Hyva dealer.</p>
Air control fails suddenly.	<p>An air hose has broken. The air-control is blocked by dirt. The knock-off is not functioning.</p>	Contact your service station or Hyva dealer.

5. 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