MATHER'S TIP TRUCK TECHNOLOGY

Background

Tip truck hydraulics systems of today are essentially no different from those supplied for many decades., despite the universal improvements in safety, productivity, quality of life and Workplace Health & Safety working conditions.

Quintessential components of gearbox, PTO, pump, hoist valve, telescopic cylinder with a barely adequate filler breather still make up many non Standard compliant Tipper hoist operating systems supplied today.

Filters, oil level guages, pump, service isolating valve and tipper safety valve (or alternatively a cheaper inadequate and non Standards compliant pilot check valve) may be supplied in part or total, subject to customer specification, or the supplier standards of the body builder.

Safety, productivity, operation methodology on level or uneven unstable ground conditions are left to drivers, irrespective of experience.

The Future

Tipper Safety Valve (TSV)

Mathers Hydraulics first became involved with Tipper Truck systems to design a valve that would provide protection from the various Hoist control operating problems that were and continue to cause accidents resulting in injury and damage.

Considerable market research and investigation has resulted in the development of our Patent Tipper Safety Valve (TSV) pneumatic and electric operated range.

Mathers Tipper Safety Valves are designed to comply with and exceed the Australian Standards AS:14.18.8 (Law in N.S.W.) and Occupational Health & Safety Workplace Code of Practice (equivalent to Australian Standards as a Benchmark for minimum design requirements in Litigation).

One of the main features of the TSV is that it is pressure compensated **providing a controlled rate of descent of the Tipper tray/hoist** regardless of load.

This feature enables compliance with a precedent set in a Court conviction and fine where the Judge ruled in the case of a fatality **"that a device to control the speed of decent of the Hoist could have been fitted."**

"Jamlock" (when the Hoist is mechanically locked in the raise position due to chassis twist) was another cause of accidents.

Here oil drains out of the Hoist and when the body is straightened out the Hoist comes crashing down causing component damage and possible injury.

Our Tipper Safety Valve automatically senses the low pressure "Jamlock" condition and retains the oil in the Hoist allowing safe lowering when the chassis is untwisted.

MH-TTT

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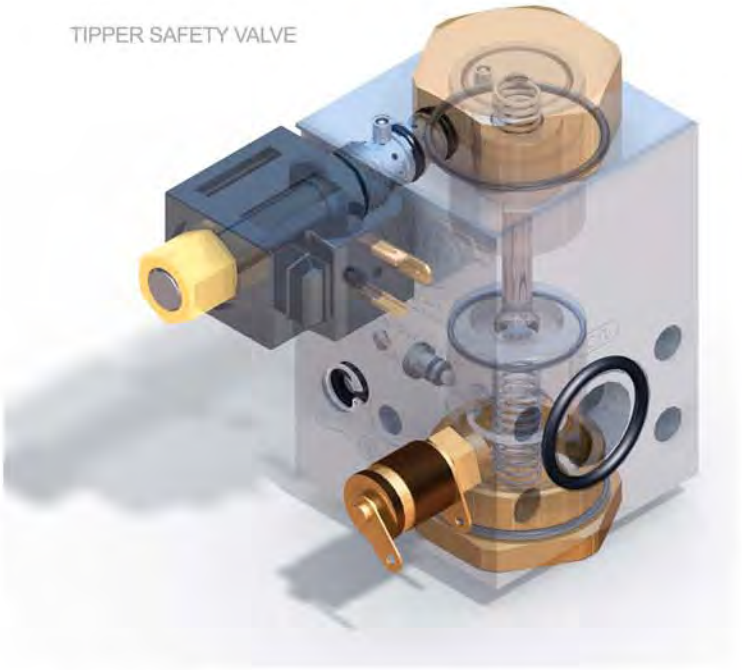
MATHERS HYDRAULICS

MATHER'S TIP TRUCK TECHNOLOGY

Other TSV design features that address problems that have and continue to cause accidents and Standard conforming requirements:

- Protection against hose burst when the hoist is being raised.
- Safe key/tag TSV pilot isolation to prevent accidental actuation of the Hoist lower control valve function during maintenance.
- Safe remote emergency manual lowering of the Hoist if stuck in the raised position (Loss of Power)
- High flow pressure drop characteristics (Standard conforming heat reduction design)
- All controls - pressure and flow are sealed and unable to be adjustable (Standards requirements)
- High pressure test point (Standard conforming requirement)
- Circuit diagram and AS:1418.8 compliance confirmation on the truck (Standards requirement)
- Audible operating alarms are also available if required.

TIPPER SAFETY VALVE



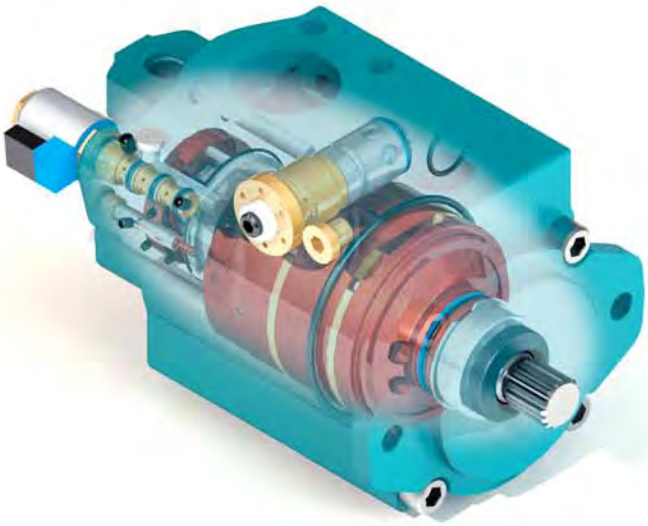
The Mathers Tipper Safety Valve is proudly Australian designed and manufactured and provides reassurance of compliance and protection for safe operation of Tipper Truck Hoist systems.

AUSTRALIAN MADE

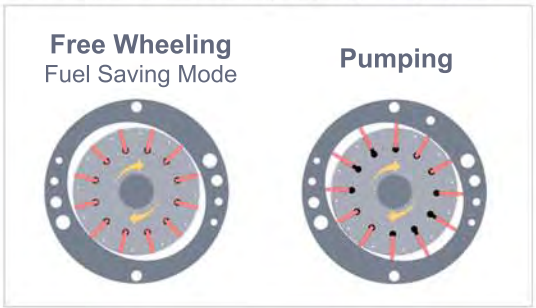
Fuel Saving Carbon Reducing FSV Hydraulic Pump

The Mathers Hydraulics FSV pump won Queenland Sustainability award from Engineers Australia in 2007 and received High Commendation for R&D.

FSV PUMP



FUEL SAVING VANE PUMP (FSV) - Operating Modes



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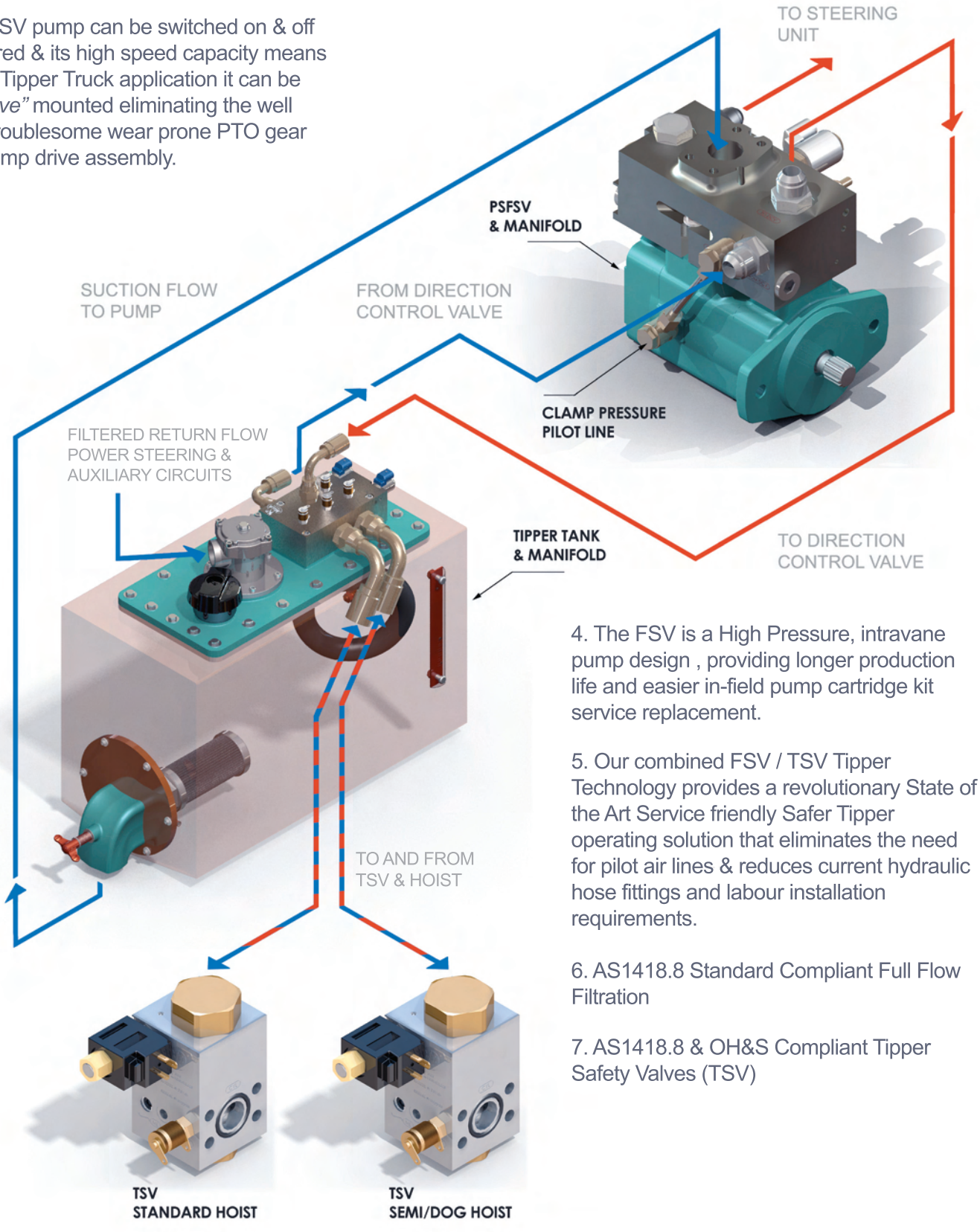
Combined Steering, Hoist, And/Or Auxiliary FSV Pump System

1. Power Steering & Auxiliary Hydraulic Tipper / Crane functions are supplied from the one FSV pump, eliminating the labour , materials & service associated with the existing extra power steering pump, reservoir and system installation.

2. The FSV Power Steering Pump provides substantial Fuel Cost Savings & reduces Carbon Emission, whilst the improved oil cooling extends power steering component life factors.

3. The FSV pump can be switched on & off as required & its high speed capacity means that in a Tipper Truck application it can be *"Live Drive"* mounted eliminating the well known troublesome wear prone PTO gear Box / Pump drive assembly.



4. The FSV is a High Pressure, intravane pump design , providing longer production life and easier in-field pump cartridge kit service replacement.

5. Our combined FSV / TSV Tipper Technology provides a revolutionary State of the Art Service friendly Safer Tipper operating solution that eliminates the need for pilot air lines & reduces current hydraulic hose fittings and labour installation requirements.

6. AS1418.8 Standard Compliant Full Flow Filtration

7. AS1418.8 & OH&S Compliant Tipper Safety Valves (TSV)

TIPPER STABILITY CONTROL SYSTEM

Tipper Stability Control System (TSC)

Future Technology for Cost Effective Safer Tipper Truck Operation.

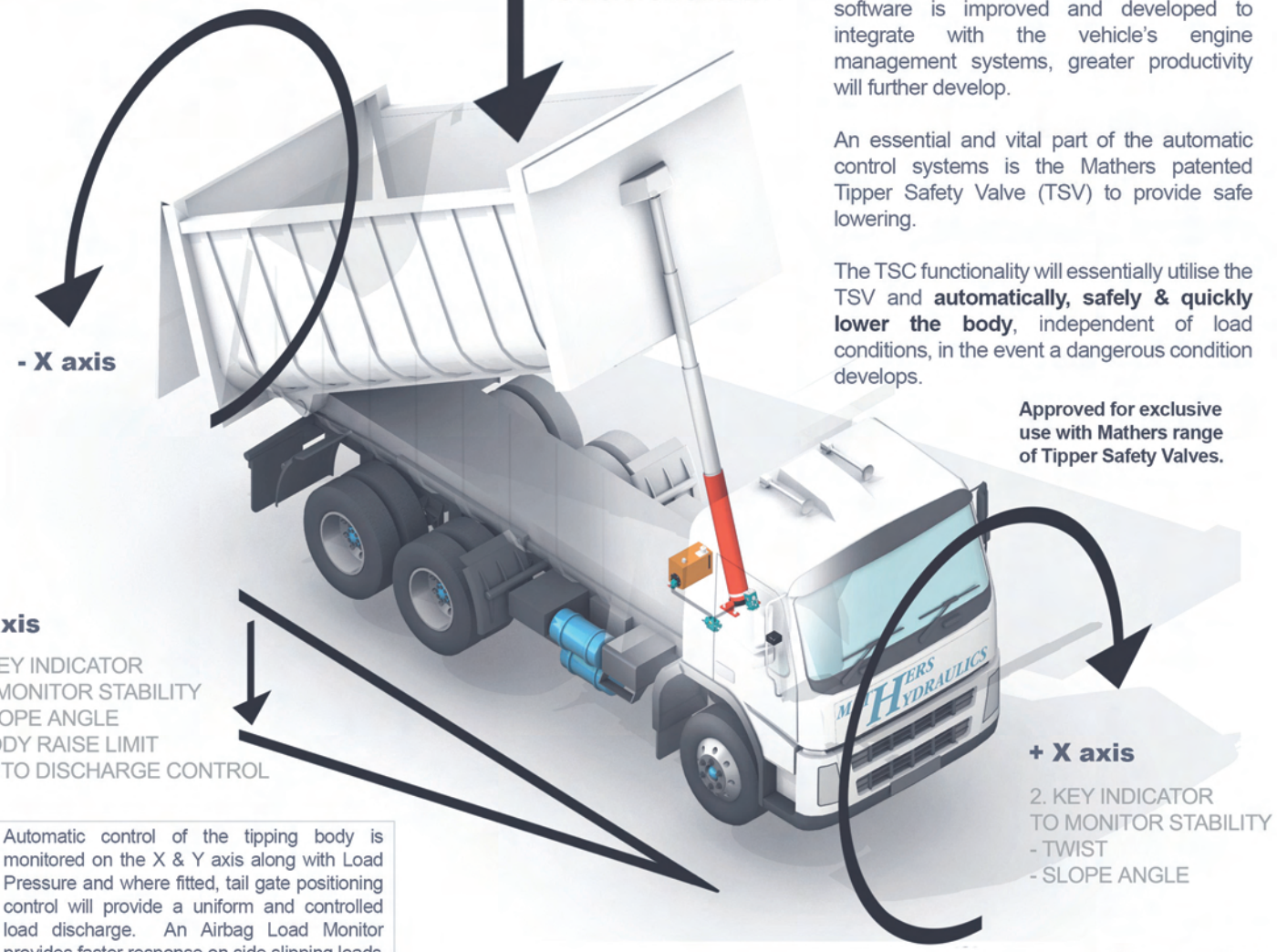
Stability control of the larger semi tipper trucks is a major issue with regular semi roll overs occuring which result in major mechanical cost damage and potential injury risk.

Mathers Hydraulics have designed Patented and are developing a stability control system, Tipper Stability Control System (TSC) that interfaces with our Tipper Safety Valves to provide automatic lowering of the truck hoist when preset X & Y axis parameters are reached. On approaching the load danger angle control settings, an alarm will warn the operator that he is at risk of rolling his tip truck over. Should the preset parameters be reached at a rate faster than human reaction time, the Tipper Safety Valve will be automatically signalled to drop the hoist reducing risk angles and protecting against roll over risk.

TSC Functionality - Designed to improve safety standards as outlined in AS 1878.8 Workplace Codes of Practice

Load Rating

1. KEY INDICATOR
TO MONITOR STABILITY



Automatic Tip/Dump Operation

Automatic control of the tipping function is programmable, and inevitably as system software is improved and developed to integrate with the vehicle's engine management systems, greater productivity will further develop.

An essential and vital part of the automatic control systems is the Mathers patented Tipper Safety Valve (TSV) to provide safe lowering.

The TSC functionality will essentially utilise the TSV and **automatically, safely & quickly lower the body**, independent of load conditions, in the event a dangerous condition develops.

Approved for exclusive use with Mathers range of Tipper Safety Valves.

Y axis

3. KEY INDICATOR
TO MONITOR STABILITY
- SLOPE ANGLE
- BODY RAISE LIMIT
- AUTO DISCHARGE CONTROL

+ X axis

2. KEY INDICATOR
TO MONITOR STABILITY
- TWIST
- SLOPE ANGLE

Automatic control of the tipping body is monitored on the X & Y axis along with Load Pressure and where fitted, tail gate positioning control will provide a uniform and controlled load discharge. An Airbag Load Monitor provides faster response on side slipping loads.

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Patent Applied For.
Mathers Hydraulics reserve the right to change specifications at any time without notice.

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