



STT TORQMAX

HYDRAULIC PARTS

Engineering and service catalogue 2026

Cylinders | pumps | motors | valves | hoses | fittings | seals

DRIVING INDUSTRY FORWARD

STT Engineering Solutions

Gauteng South Africa

060 935 6542 | info@stteng.co.za | www.stteng.co.za

Hydraulic range and catalogue guide

TORQMAX hydraulic parts support industrial machinery, mobile equipment and engineered replacement enquiries. This catalogue provides product families, selection fields, calculated examples and the information needed to quote components and repairs.

Enquiry family	Product group	Options to specify
HY-CYL	Hydraulic cylinders	Double acting, single acting, telescopic or custom
HY-PMP	Pumps	Gear, vane or piston configuration
HY-MOT	Hydraulic motors	Orbital, gear or piston configuration
HY-VLV	Valves and manifolds	Directional, pressure, flow and load control
HY-HOS	Hose assemblies	Hose construction, size and end connections
HY-FIT	Fittings and adapters	Thread, sealing form, size and material
HY-SEA	Seals and service kits	Cylinder, pump, motor and valve kits
HY-FLT	Filtration and accessories	Filters, breathers, gauges and reservoir parts

Selection and supply

Family codes are enquiry references rather than stocked part numbers. Dimensions, pressure ratings, fluid compatibility, availability and supply scope are confirmed for the exact component. Custom manufacture and bought-in components are identified separately in the quotation.

Our workshop includes CNC turning with C-axis capability, CNC milling, manual turning, a hydraulic fitting shop with a test bench and fabrication facilities. Repair scope and required outside processes are agreed after inspection.

Contents

Cylinder arrangements and force calculations; cylinder spare parts; pump flow and motor torque; valves; fittings; hose assemblies; seals; filtration and power units; yellow machine replacements; repairs and testing; ordering and technical references.

Hydraulic cylinders

Cylinder enquiries cover replacement units, custom interfaces and rebuilds. Match the mounting and load path as well as bore, rod and stroke.

Arrangement	Application focus	Required details
Double acting	Powered extension and retraction	Bore, rod, stroke, both ports and load cycle
Single acting	Powered travel with external return	Return load, venting and travel direction
Welded body	Compact installation envelope	End construction and service access
Tie rod	Serviceable industrial assembly	Mounting pattern and tie rod arrangement
Telescopic	Long stroke within a short envelope	Stage sequence, loads and retracted length
Custom	Machine-specific interfaces	Drawing, sample or complete dimensional survey

Cylinder enquiry dimensions

State bore D, rod diameter d, stroke S, closed mounting center length, extended length, mounting pin diameters and widths, port locations and hose clearance. Include orientation, side load, speed, working pressure, peak pressure, fluid, temperature and operating hours.

Design checks

Rod buckling, mounting loads, tube and end retention, fatigue, cushioning and seal limits require review for the actual duty. A larger bore does not by itself establish a complete cylinder pressure rating. Confirm load holding arrangements where the cylinder supports a suspended or over-running load.

Enquiry example: TORQMAX HY-CYL | double acting | 80 mm bore | 45 mm rod | 500 mm stroke | pin mounted | drawing and operating duty supplied. Dimensions are requested values, subject to design approval.

Calculated cylinder force schedule

The schedule below is a geometry calculation for planning. It assumes 160 bar at the powered port, zero backpressure at the opposite port and no friction. It does not rate a cylinder or confirm an available bore and rod combination.

Bore mm	Rod mm	Piston area mm ²	Extension kN	Retraction kN
40	25	1257	20.11	12.25
50	30	1963	31.42	20.11
63	36	3117	49.88	33.59
80	45	5027	80.42	54.98
100	56	7854	125.66	86.26
125	70	12272	196.35	134.77
160	90	20106	321.70	219.91
200	110	31416	502.65	350.60

Calculation method

Piston area $A = \pi \times D^2 / 4$. Annular area $A_{ann} = \pi \times (D^2 - d^2) / 4$. Force kN = pressure bar x area mm² / 10000. For a double acting cylinder, subtract opposing-port pressure force and friction from the powered-port force.

Speed and oil volume example

For an 80 mm bore, 45 mm rod and 500 mm stroke: extension volume is 2.513 litres and retraction volume is 1.718 litres. At 20 L/min supplied flow, ideal extension time is 7.54 seconds and retraction time is 5.15 seconds. Actual timing includes valve losses, pump delivery, leakage and acceleration.

Travel speed mm/s = 16666.7 x flow L/min / effective area mm². Stroke volume litres = area mm² x stroke mm / 1000000. Use the annular area for rod-side supplied flow.

Cylinder spare parts and machining

Identify cylinder parts from the original drawing, measured sample and retained mating components. Final part numbers follow the approved drawing and bill of materials.

Suffix	Part group	Dimensions and condition required
ROD	Piston rod	Diameter, length, threads, straightness and surface condition
TUB	Cylinder tube	Bore, outside diameter, length, finish and end details
PST	Piston	Bore fit, seal grooves, retention and ports
GLD	Gland or guide	Rod fit, bearing, seal grooves and body retention
CAP	End cap	Port, attachment, mounting and sealing dimensions
PIN	Pins and bushes	Diameter, fit, bearing length and load condition
KIT	Seal kit	Every groove and mating diameter; fluid and temperature
MNT	Mounting hardware	Clevis, eye, trunnion, flange or bracket dimensions

Material and surface requirements

Rod material, hardness, coating, surface finish and corrosion resistance are selected for the service. Tube bore finish, straightness and wall requirements follow the released design. Welding, coating, honing and heat treatment are specified processes rather than assumptions based on appearance.

Repair assessment

Inspect rod scoring, chrome damage, bent rods, worn guides, damaged grooves, tube ovality, cracked mounts and port condition. A new seal kit alone will not correct damaged sliding surfaces or alignment.

Spare enquiry: TORQMAX HY-CYL-KIT | machine and cylinder serial | bore, rod and seal dimensions | fluid and temperature | photographs and sample available.

Hydraulic pumps and calculated flow

Match displacement, direction of rotation, mounting, shaft and port arrangement. Working pressure and permissible speed come from the exact pump data sheet.

Pump family	Selection fields	Replacement checks
Gear pump	Displacement, pressure and speed	Shaft, flange, rotation and port positions
Vane pump	Fixed or variable displacement	Cartridge, control and fluid requirements
Axial piston	Open or closed circuit	Control type, drain and inlet requirements
Tandem assembly	Each section displacement	Drive-through capacity and section order

Calculated flow at 1500 RPM

Displacement cm ³ /rev	Theoretical flow L/min	Flow at assumed 0.90 volumetric efficiency
10	15.0	13.5
16	24.0	21.6
25	37.5	33.8
32	48.0	43.2
50	75.0	67.5
63	94.5	85.0
80	120.0	108.0
100	150.0	135.0

Flow L/min = displacement cm³/rev x speed RPM x volumetric efficiency / 1000. Theoretical flow uses efficiency 1.00. These are calculated examples, not pump ratings or available models.

Power example

At 160 bar and 40 L/min, hydraulic power is 10.67 kW. With assumed overall pump efficiency 0.85, required shaft power is 12.55 kW. Driver selection also considers startup, duty and control behavior. Hydraulic power kW = pressure bar x flow L/min / 600.

Hydraulic motors and calculated torque

Motor selection requires both continuous and intermittent duty data. Match displacement, output shaft, flange, rotation, load capacity, case drain and allowable return pressure.

Motor family	Enquiry focus
Orbital	Low-speed operation, shaft loads, drain and return pressure
Gear	Speed range, displacement and output interface
Axial piston	Control, drain, inlet and operating duty
Radial piston	Low-speed duty, displacement and mounting reactions

Calculated duty at 160 bar pressure difference

Displacement cm³/rev	Ideal torque N·m	Torque at assumed 0.90 mechanical efficiency	RPM at 40 L/min and assumed 0.90 volumetric efficiency
25	63.7	57.3	1440
50	127.3	114.6	720
80	203.7	183.3	450
100	254.6	229.2	360
160	407.4	366.7	225
250	636.6	573.0	144
400	1018.6	916.7	90

Torque N·m = pressure difference bar x displacement cm³/rev x mechanical efficiency / (20 x pi). Speed RPM = supplied flow L/min x 1000 x volumetric efficiency / displacement cm³/rev. Efficiency assumptions are illustrative. Pressure difference is inlet pressure minus outlet pressure.

Installation and duty

Confirm starting torque, stall duration, over-running loads, braking and the full operating speed range. External radial and axial loads may require separate support bearings. Case drain requirements must follow the selected motor instructions.

Valves manifolds and control parts

Specify the circuit function before choosing a valve. Port sizes alone do not establish flow capacity or suitable pressure drop.

Enquiry group	Function	Information to supply
Directional	Direct flow to actuators	Ways, positions, spool center, actuation and schematic
Relief	Limit pressure	Setting, full-flow behavior and adjustable range
Reducing	Control downstream pressure	Pilot arrangement and downstream circuit
Flow control	Set actuator speed	Flow range, compensation and flow direction
Check	Permit one-way flow	Cracking pressure, seat and flow requirement
Pilot check	Hold a circuit until piloted	Pilot ratio, release pressure and load behavior
Counterbalance	Control over-running loads	Load pressure, pilot circuit and setting
Cartridge and manifold	Integrate circuit functions	Exact cavity, thread, schematic and material

Electrical and interface data

For solenoid valves provide coil voltage, AC or DC, connector, duty, manual override and environmental needs. Record mounting pattern, bolt spacing, port designation, seals and manifold face dimensions. Identify cartridge cavities by complete manufacturer designation.

Replacement and spares

Quote spool assemblies, coils, connectors, cartridge inserts and seal kits by exact model and revision. Similar-looking bodies may use different center functions or seal arrangements. Set and verify pressure controls against the agreed circuit requirements.

Hydraulic fittings adapters and couplings

Identify the thread and sealing interface together. A fitting that screws into a port is not necessarily a compatible hydraulic connection.

Connection family	Sealing feature to identify	Enquiry measurements
BSPP	Parallel thread with specified seal arrangement	Thread diameter, pitch, port face and seat
BSPT	Tapered thread	Thread size, taper and approved sealant
Metric	Parallel thread with specified seat or seal	Diameter, pitch, seat and tube dimensions
JIC	37 degree flare seat	Thread size, flare size and male or female end
ORFS	O-ring face seal	Thread and face dimensions; seal size
SAE O-ring boss	Port O-ring seal	Thread and port dimensions; seal specification
NPT	Tapered pipe thread	Nominal size, thread form and engagement
Flange	Bolted flange with seal	Flange series, size, bolt spacing and O-ring

Adapter and quick coupling orders

Specify both ends independently: connection family, size, male or female, straight or elbow, orientation and material. For quick couplings record body series, size, sealing face, pressure duty and whether connection under pressure is permitted. Interchangeability requires the exact mating series.

Machined parts

Custom adapters, plugs and manifold parts require a released drawing with material, pressure basis, threads, sealing faces, tolerances and inspection. CNC capability does not establish a pressure rating without design verification.

Example: TORQMAX HY-FIT | end A BSPP G 1/2 male with specified seal | end B JIC 3/4-16 female swivel | 90 degree | pressure, material and drawing confirmed.

Hose assemblies and hose protection

Order the complete assembly using hose size, construction, rated duty, length and both end connections. Hose and fittings must be an approved compatible assembly system.

Field	Required assembly details
Size	Nominal bore, actual hose identification and flow
Duty	Working and peak pressure, impulses, vacuum if applicable
Fluid	Fluid type, additives and hose compatibility
Temperature	Fluid and external temperature; nearby hot surfaces
Length	Defined measurement points and installation allowance
Ends	Thread, seal, size, shape and swivel on each end
Orientation	Clocking angle between elbow ends
Routing	Minimum bend radius, movement, clamps and abrasion
Protection	Sleeve, guard, heat protection and identification

Nominal bore planning sizes

Dash reference	Nominal inch bore	Approximate bore mm
-04	1/4	6.4
-06	3/8	9.5
-08	1/2	12.7
-12	3/4	19.1
-16	1	25.4

Dash values here are hose bore references only, not fitting thread sizes. Exact internal diameter, construction, pressure, bend radius and temperature limits come from the selected hose data sheet.

Parker selection guidance considers pressure, temperature, fluid compatibility and approved assembly combinations. Apply the selected supplier crimp specification and inspection method. Assembly working limits must account for every component. See technical references.

Seals wear rings and service kits

A seal replacement requires the groove and mating geometry, operating conditions and material compatibility. Identify seals by dimensions and profile rather than color alone.

Part	Purpose	Required dimensions
Rod seal	Retain fluid along the rod	Rod diameter, groove diameter and width
Piston seal	Separate cylinder chambers	Bore, groove root, width and piston construction
Wiper	Exclude external dirt	Rod and housing diameters, groove and retention
Wear ring	Guide rod or piston	Diameter, width, thickness and allowable clearance
O-ring	Seal static or specified dynamic interfaces	Inside diameter, cross-section and groove
Backup ring	Support seal against extrusion	Groove, clearance, pressure and material
Rotary shaft seal	Seal rotating shafts	Shaft, housing, width and rotation conditions

Material selection

NBR, FKM, polyurethane, PTFE-based and other seal materials are considered against the actual fluid, temperature, pressure, motion and surface condition. These material names do not imply universal interchangeability. Confirm compound grade and the complete seal supplier specification.

Kit contents

Cylinder kits can include rod and piston seals, wipers, wear rings, O-rings and backup rings. Pump, motor and valve kits follow the exact model and revision. Kit quantities and profiles are confirmed from the bill of materials or complete measured sample set.

Record seal orientation during strip, inspect grooves and sliding surfaces, and retain photographs. A replacement profile must fit the groove and application rather than merely matching an outside diameter.

Filtration reservoirs and power unit parts

Filtration, cooling and reservoir accessories are selected against system flow, contamination needs and operating temperature. Provide a circuit diagram for complete power unit enquiries.

Component	Fields to specify
Pressure filter	Flow, pressure, bypass, element rating and indicator
Return filter	Maximum return flow, cold-oil pressure drop and bypass
Suction component	Pump inlet restriction and permitted construction
Filter element	Housing model, dimensions, media and efficiency data
Breather	Air flow, contamination and water ingress exposure
Reservoir	Working volume, access, baffles, drains and installation
Cooler	Required heat rejection, fluid flow and ambient conditions
Gauge and switch	Range, connection, accuracy and electrical output
Power unit	Pressure, flow, duty, controls, reservoir and motor supply

Power and thermal planning

A 200 bar circuit at 30 L/min carries 10 kW of hydraulic power. At assumed overall pump efficiency 0.85, shaft power is 11.76 kW. Heat rejection must follow circuit losses and operating duty; reservoir volume alone does not establish sufficient cooling.

Accumulator enquiries

Provide exact accumulator type, volume, pressure data, fluid, mounting and certification requirements. Gas charging and stored energy servicing require the manufacturer procedure and suitably qualified personnel. This catalogue does not assign a universal precharge or test pressure.

Yellow machine hydraulic replacements

Enquiries for excavators, loaders, graders, dozers and other mobile equipment require machine identity and installation details. Replacement suitability is confirmed for the specific machine and component.

Machine area	Parts for enquiry	Fit and duty information
Boom arm and bucket	Cylinders, rods, tubes, pins and seal kits	Machine model, cylinder serial and load cycle
Steering	Cylinders, hoses and fittings	Steering circuit and mounting interfaces
Attachments	Auxiliary hose and valve parts	Required pressure, flow and coupler series
Travel and swing	Motor and pump components	Exact unit model, drain and controls
Tilt and lift	Custom cylinder or rebuild	Closed length, stroke, pins and clearance
Service lines	Hose assemblies and protection	Routing, movement and complete end details

Machine survey

Supply manufacturer, model, year, serial number and original part number where available. Include installed photographs, port and hose details, mounting dimensions and the original component markings. Record guards, access restrictions and the space available for removal.

Replacement identity

Retain the original equipment identity in the asset record. STT replacement manufacture or repair does not imply an authorized OEM relationship. Proposed changes to stroke, rod diameter, mounting or flow require review of the machine behavior and load path.

Commercial scope

The quotation identifies repair, custom manufacture or sourced replacement; drawing approval; tests; delivery basis and exclusions. Availability and interchangeability are confirmed for each enquiry.

Hydraulic repair testing and delivery

Repairs begin with inspection and an agreed scope. Testing uses a documented procedure for the exact component and its intended duty.

Stage	Work and record
Intake	Component identity, symptoms, history and photographs
Strip	Clean, dismantle and identify retained parts
Inspect	Measure surfaces, clearances, grooves and interfaces
Quote	Agree parts, machining, outside processes and tests
Manufacture	Produce approved parts and record critical dimensions
Assemble	Fit parts with correct cleanliness and seal orientation
Test	Record conditions, readings and acceptance results
Deliver	Identification, report, installation and service details

Test records

Cylinder testing can record pressure, stroke, leakage and function under agreed conditions. Pump and motor tests can record pressure, flow, speed, leakage and temperature using suitable instrumentation. Specify the test method, permitted limits and equipment capability before work starts; no single test pressure applies to every component.

Installation and service

Flush and clean the relevant circuit, verify fluid and filter requirements, route hoses correctly and confirm controls before commissioning. Isolate and release stored pressure before servicing. Never use a hand to locate a pressurized leak.

Delivery records identify the part or assembly, drawing revision, fitted components and agreed test results. A bench function test alone does not establish machine-level compatibility or a complete service-life guarantee.

Ordering information and technical references

Send the component identity, application and dimensional information below so STT can prepare a specific quotation.

Enquiry field	Information required
Product	Family, existing maker, model and part number
Application	Machine or process, operating duty and symptoms
Hydraulic duty	Working and peak pressure, flow, speed and load
Fluid	Fluid specification and temperature range
Interfaces	Ports, threads, seals, shafts, mounts and dimensions
Documents	Drawing, schematic, photographs and samples
Scope	New part, custom manufacture, seal kit or repair
Commercial	Quantity, location, delivery needs and inspection

Enquiry examples

Cylinder: HY-CYL | bore 80 mm | rod 45 mm | stroke 500 mm | mounting drawing | pressure and duty supplied.
Hose: HY-HOS | size -08 | length and measurement basis | both ends specified | fluid, pressure and routing supplied.
Pump: HY-PMP | exact maker and model | displacement | rotation | shaft and flange | control and duty supplied.

Technical references

Parker Safety Guide for Selecting and Using Hose Tubing Fittings and Related Accessories. Guidance for component selection and assembly compatibility; no Parker affiliation or transferred product rating is implied.
<https://www.parker.com/content/dam/Parker-com/Literature/Parflex/Parker-Safety-Guide.pdf>

Bosch Rexroth hydraulic cylinder product and configuration guidance. Reference for application-specific cylinder selection; no Rexroth model data is represented as a TORQMAX rating.
<https://www.boschrexroth.com/en/us/c/cylinders/>

Contact and issue

STT Engineering Solutions | Gauteng South Africa
060 935 6542 | info@stteng.co.za | www.stteng.co.za
TORQMAX hydraulic parts issue 1 | 2 October 2026. Maintain the Word document as the editable master and the PDF as the matching customer issue. Final product ratings and supply scope follow the approved component data sheet and quotation.