



APDL Approved Components List

Asia-Pacific Driveline

SD-2007

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1. Scope

The intent of this approved components list is to minimize the proliferation of components within Nexteer Automotive Asia-Pacific Driveline. Any deviation from this list shall be submitted in writing and written approval obtained from the appropriate Nexteer Automotive Engineer in Charge.

For clarity, the format of SD-2007 matches that of Nexteer Specification SD-007 (Global Common Components) which is referenced throughout this document. To ensure appropriate components are selected, the user of this document must also review SD-007. Any change to SD-007 is documented within this document with the following convention:

- All items listed in SD-007 – any component listed in SD-007 is approved for use.
- Additional components added to the published SD-007 specification.
- Modified requirements to the published SD-007 specification.
- Clarification text included to assist in the understanding of the requirements published in SD-007.
- (BLANK) indicates no requirement.

Where an approved supplier is followed by “(Special Applications)”, these components may be used, but require Controls Engineering approval.

2. Manufacturing Engineering - Major Mechanical Components

The “Mechanical Component” column is organized by component. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

The “APDL Common / Requirement” column has two functions:

- Where components are identified, this is the Nexteer Automotive Asia-Pacific Driveline approved (required) component.
 - Where multiple brands are listed, OEMs are allowed to select the one that provides the best value. Components are not listed in any preferred order.
- Where specifications are provided, components are required to meet these specifications.

NOTE: To identify regional requirements, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the designated supplier’s components may be used.

The “Examples” column lists example components that may be used providing they meet the specifications of the “Global Common / Requirement” column. These example components are readily available in our global regions. Example components are not listed in any preferred order.

NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier’s components may be used.

NOTE: Changes since the last revision are highlighted.

Mechanical Component	APDL Common / Requirement	Examples
A. Brakes, Electric	All items listed in SD-007	
B. Clutch / Brake	All items listed in SD-007	NOTE: Air is preferred over Electric.
1. Air		
2. Electric	All items listed in SD-007	Dynatorque (Special Applications)
C. Driverless Vehicles	NOTE: All autonomous Mobile Robots and Automated Guided Vehicles shall comply with the safety requirements and protective measures detailed in ISO 3691-4.	
D. Gear Reducers	All items listed in SD-007	
E. Indexers	All items listed in SD-007	
F. Leak Testing Units	All items listed in SD-007	
G. Mist Collectors		Royal Filterist
H. Electric Presses	All items listed in SD-007	
I. Industrial Robots Hardware	Selection of hardware below is application specific. Refer to SD-1040 (SD-007 components) and SD-2040 (SD-2007 specific components) for clarification.	
1. Actuators	All items listed in SD-007 ABB-IRB2600 ABB-IRB4600 ABB SCARA	
2. Controller	All items listed in SD-007 ABB-IRC5 ProfiNet Communication Protocol	
3. Safety I/O	All items listed in SD-007	
4. Transit Board, End Effector I/O	All items listed in SD-007	
5. Auto / T1 Switch Retro Kit	All items listed in SD-007	

<p>J. Industrial Robot Software</p> <p>1. ProfiNet Communication Package</p> <p>2. Motion Package</p> <p>3. DCS Options (a or b required)</p> <p>4. Karel</p>	<p>Software options below are all required unless specified. Refer to SD-1040 (SD-007 components) and SD-2040 (SD-2007 specific components) for clarification.</p> <p>Software options below are all required unless specified. Refer to SD-1040 for clarification.</p> <p>A05B-2600-J076 Fanuc Interface Card</p> <p>A05B-2600-J083 Molex ProfiNet Card</p> <p>A05B-2600-R834 ProfiNet Software</p> <p>A05B-2600-J931 ProfiNet Safety Software</p> <p>NOTE: Compact controllers are designed for SCARA robots and do NOT include a robot teach pendant or cable. The following part numbers are required:</p> <p>A05B-2256-H103 Teach Pendant</p> <p>A05B-2690-H201 Teach Pendant Cable</p> <p>All items listed in SD-007</p> <p>All items listed in SD-007</p> <p>All items listed in SD-007</p>	
<p>K. Screwdrivers</p>	<p>Refer to the Manufacturing equipment Purchase Specification and / or the Purchasing Engineer.</p> <p>All items listed in SD-007</p>	
<p>L. Shaft Overload</p> <p>1. Not Timed</p> <p>2. Timed</p>	<p>All items listed in SD-007</p> <p>All items listed in SD-007</p>	
<p>M. Variable Ratio Pulleys</p> <p>NOTE: All pulleys and sprockets to be attached with a taper-lock or equivalent device.</p>	<p>All items listed in SD-007</p>	

3. Manufacturing Engineering – Process and Test Engineering

The "Process & Test Engineering" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

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 - Where multiple brands are listed, OEMs are allowed to select the one that provides the best value. Components are not listed in any preferred order.
- Where specifications are provided, components are required to meet these specifications.

NOTE: To identify regional requirements, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the designated supplier's components may be used.

The "Examples" column lists example components that may be used providing they meet the specifications of the "APDL Common / Requirement" column. These example components are readily available in our global regions. Example components are not listed in any preferred order.

NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier's components may be used.

NOTE: Changes since the last revision are highlighted.

Process and Test Engineering	APDL Common / Requirement	Examples
A. Data Acquisition Cards	All items listed in SD-007	
B. DC Power Supply	All items listed in SD-007	
C. Motion Control	Siemens S120 S210 S200 V90 (Requires Nexteer Approval) Inovance (Using Tech Objects / epos is not allowed) SV660F SV680F	
D. I/O Modules	All items listed in SD-007	
E. Signal Conditioner	All items listed in SD-007	
F. Transducers	All items listed in SD-007	
G. Software Requirements	LabView and Fanuc Applications All items listed in SD-007 Visual Studio C# 3 rd Party library requires Nexteer Approval.	

4. Pneumatic Components

The "Pneumatic Component" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

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NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier's components may be used.

All components shall be pre-lubricated for life by the manufacturer. Actuators or valves requiring additional line lubrication require advance written approval.

All components shall be rated for a minimum 125 PSI service.

NOTE: Changes since the last revision are highlighted.

Pneumatic Component	APDL Common / Requirement	Examples
A. Accessories	All items listed in SD-007	
B. Actuators	All items listed in SD-007	
C. Conductors	All items listed in SD-007	
D. Connectors	All items listed in SD-007	
E. Air Preparation	All items listed in SD-007	
F. Valves		
1. Ball	All items listed in SD-007	
2. Check	All items listed in SD-007	
3. Directional (Electronically Controlled)		
a) Manifold Mount, 5-Way 15407/2, 26mm (Size 01)	All items listed in SD-007	
b) Manifold mount, 5-way 5599/2 (Size 02)	All items listed in SD-007	
c) 2/3-Way Valve Air Pilot	All items listed in SD-007	
d) Press-Brake / Clutch	All items listed in SD-007	
e) Safety Valve	All items listed in SD-007 Festo MS6-SV-*	
f) Proportional Valve	All items listed in SD-007	
4. Flow Control	All items listed in SD-007	
5. Relief	All items listed in SD-007	
6. Safety Lock-Out with Exhaust	All items listed in SD-007	
7. Shuttle	All items listed in SD-007	
8. Temperature Control – Air Operated	All items listed in SD-007	
9. Two-Hand, Anti-Tie Down Air logic (Special Applications)	All items listed in SD-007	
10. Quick Exhaust	All items listed in SD-007	

5. Hydraulic Components

The "Hydraulic Component" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

The "APDL Common / Requirement" column has two functions:

- Where components are identified, this is the Nexteer Automotive Asia-Pacific Driveline approved (required) component.
 - Where multiple brands are listed, OEMs are allowed to select the one that provides the best value. Components are not listed in any preferred order.
- Where specifications are provided, components are required to meet these specifications.

NOTE: To identify regional requirements, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the designated supplier's components may be used.

The "Examples" column lists example components that may be used providing they meet the specifications of the "APDL Common / Requirement" column. These example components are readily available in our global regions. Example components are not listed in any preferred order.

NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier's components may be used.

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Hydraulic Component	APDL Common / Requirement	Examples
A. Accessories		
1. Accumulators	All items listed in SD-007 YUKEN (I)	
2. Accumulator Safety Block	All items listed in SD-007 YUKEN (I)	
3. Air Breather (3 Micron)	All items listed in SD-007 YUKEN (I)	
4. Flow Meter		
a) Electrical (Special Applications)	All items listed in SD-007 YUKEN (I)	
b) Visual	All items listed in SD-007 YUKEN (I)	
5. Flow Switches	All items listed in SD-007	
6. Coupling, Drive	All items listed in SD-007	
7. Gauge		
a) Pressure	All items listed in SD-007	
b) Gauge adapter	All items listed in SD-007 YUKEN (I)	
c) Pressure Tap, Test Port	All items listed in SD-007 YUKEN (I)	
8. Flow Divider	All items listed in SD-007	
9. Isolation Mounts – Pump Mounting	All items listed in SD-007	
10. Isolation Pad Material	All items listed in SD-007	
11. Intensifier		
a) Air / Oil Double Acting Press	All items listed in SD-007	
b) Continuous Motion Press	All items listed in SD-007	
12. Manifolds, Multiple Stations	All items listed in SD-007	
13. Pump / Motor “C” Face Adapters	All items listed in SD-007	
14. Rod Coupler, Self-Aligning	All items listed in SD-007	
15. Sight Gauge with Thermometer	All items listed in SD-007	
16. Shock Absorbers	All items listed in SD-007	
17. Sub-Plates or Manifolds	All items listed in SD-007	
18. Temperature Control (Water Modulating)	All items listed in SD-007	

Hydraulic Component	APDL Common / Requirement	Examples
19. Water Strainer	All items listed in SD-007	
20. Water Flow Indicator	All items listed in SD-007	
B. Actuators	All items listed in SD-007 YUKEN (I)	
C. Conductors	All items listed in SD-007	
D. Connectors	All items listed in SD-007 YUKEN (I)	
E. Fluid Conditioning	All items listed in SD-007 YUKEN (I)	
F. Valves	All items listed in SD-007 YUKEN (I)	
G. Power Units (Flooded inlet only)	All items listed in SD-007	
H. Pumps	All items listed in SD-007 YUKEN (I)	

6. Lubrication Components

The "Lubrication Component" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

The "APDL Common / Requirement" column has two functions:

- Where components are identified, this is the Nexteer Automotive Asia-Pacific Driveline approved (required) component.
 - Where multiple brands are listed, OEMs are allowed to select the one that provides the best value. Components are not listed in any preferred order.
- Where specifications are provided, components are required to meet these specifications.

NOTE: To identify regional requirements, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the designated supplier's components may be used.

The "Examples" column lists example components that may be used providing they meet the specifications of the "APDL Common / Requirement" column. These example components are readily available in our global regions. Example components are not listed in any preferred order.

NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier's components may be used.

NOTE: Reference GM LS-1 (GM 1720, Version 5.0, Jan 2015) and GM LS-2 (GM 1721, Version 6, Jan 2011) for proper application and fluid selection.

Contact the Nexteer Automotive Lubrication Engineer to obtain the non-productive lubricant specification for machine tool lubricants, and the GM LS-2 product approval and cross reference listing. GM LS-1 and GM LS-2 are available at <https://www.nexteerdatabase.com/>.

NOTE: Approval of the lubrication system by the following is required on each application:

- Control Engineer
- Lubrication Engineer

NOTE: Changes since the last revision are highlighted.

Machine Lubrication Component	APDL Common / Requirement	Examples
A. Accessories		
1. Regulator (Mastic)	All items listed in SD-007 Cenlub (I)	
2. High pressure flexible lines for lubrication applications	All items listed in SD-007 Cenlub (I)	
3. Relief	Graco (grease) All items listed in SD-007 Cenlub (I) Graco (air) All items listed in SD-007 (90 PSI) 110065	
4. Block Cycle Indicator (4-Pin Micro)	All items listed in SD-007	
5. Pressure Switch	All items listed in SD-007 Cenlub (I)	
B. Lubrication System	All items listed in SD-007 Cenlub (I)	
C. Pumps	All items listed in SD-007 Cenlub (I)	
D. Divider Valves	All items listed in SD-007 Cenlub (I)	
E. Filters	All items listed in SD-007 Cenlub (I)	

Part Lubrication Component	APDL Common / Requirement	Examples
A. Accessories	All items listed in SD-007 Cenlub (I)	
B. Pumps	All items listed in SD-007 Cenlub (I)	
1. 55 Gallon	All items listed in SD-007 Cenlub (I)	
2. 5 Gallon	All items listed in SD-007 Cenlub (I)	
C. Dispensers NOTE: Filled and dispensed position sensors are required on all Dopag and GP Reeves GPMD dispensers.	All items listed in SD-007 Cenlub (I)	

7. Machine Controls Electrical Components

The "Machine Controls Electrical Component" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

The "APDL Common / Requirement" column has two functions:

- Where components are identified, this is the Nexteer Automotive Asia-Pacific Driveline approved (required) component.
 - Where multiple brands are listed, OEMs are allowed to select the one that provides the best value. Components are not listed in any preferred order.
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The "Examples" column lists example components that may be used providing they meet the specifications of the "APDL Common / Requirement" column. These example components are readily available in our global regions. Example components are not listed in any preferred order.

NOTE: To identify regional preferences, the following notation is used: (C) – China; (I) – India. If not specifically noted with region letter designation, any of the listed supplier's components may be used.

NOTE: Where an approved supplier is followed by "(Special Applications)," these components may be used but require the Controls Engineer's prior approval.

NOTE: Changes since the last revision are highlighted.

Machine Controls Electrical	APDL Common / Requirement	Examples
A. Circuit Breakers	All items listed in SD-007	
B. Power Supplies	All items listed in SD-007	
C. Drives (Variable Frequency)	SIEMENS SINAMICS G120	
D. Motion Control 1. Servo Drives	SIEMENS S120 S210 S200 V90 (Requires Nexteer Approval) Inovance (Using Tech Objects / epos is not allowed) SV660F SV680F IAI (Intelligent Actuator Inc.) All items listed in SD-007 PCON CGV Series	
2. Servo Motors	SIEMENS SIMOTICS-S INOVANCE IAI (Intelligent Actuator Inc.) RCP4-SA7C-I-56P-*-*P3-M-B (Slider Actuator) RCP4-RA6C-I-56P-*-*P3-M-B (Rod Style Actuator) RCP2-RTCBL-I-35P-*-*360-PS-M (Rotary) RCS2-RTC10L-*-*360-T2-M-L (Rotary)	
3. Multi-Axis Systems a) Two Axis	All items listed in SD-007 ROBOSTAR DELTA FESTO	
b) Three Axis	All items listed in SD-007 ROBOSTAR DELTA FESTO	
E. Enclosure	All items listed in SD-007	
F. Ethernet Switch 1. Managed (Required for Factory Network Connection)	All items listed in SD-007 SIEMENS SCALANCE X-200	

Machine Controls Electrical	APDL Common / Requirement	Examples
2. Lightly Managed	All items listed in SD-007 SIEMENS TP LINK PHOENIX MURR	
3. Power Over Ethernet (PoE) Injector	All items listed in SD-007	
4. Ethernet Network Media (Cables)	All items listed in SD-007	
G. Fuses	All items listed in SD-007	
H. Human Machine Interface Devices 1. Graphic Terminal	SIEMENS TP Comport 700 TP Comport 900 KTP Basic 700 KTP Basic 900 KTP Comport 700 KTP Comport 900 INOVANCE IT7000E	
I. Code Reader (1D & 2D Codes) 1. Basic Applications NOTE: Feasibility study recommended.	All items listed in SD-007 Datalogic PowerScan 9600 (Handheld) Cognex DMR-8050E-0200 (Handheld) Zebra DS3608/3678 with EA3600 (Handheld) Keyence HR-X100N with HR-NU2 (Handheld) HikRobot IDH3000 (Handheld)	

Machine Controls Electrical	APDL Common / Requirement	Examples
2. Challenging Applications NOTE: Feasibility study required.	All items listed in SD-007 Datalogic PowerScan 9600 (Handheld) Keyence SR-G100N (Handheld) SR-X300N (Fixed) HikRobot IDH7000 (Handheld) ID3000 (Fixed)	
3. Code Verifiers	All items listed in SD-007 Keyence SR-2000N	
J. Laser Markers	All items listed in SD-007	
K. Lights	All items listed in SD-007	
L. Motors (3-Phase)	All items listed in SD-007	
M. Plug / Socket Combination	All items listed in SD-007	
N. Programmable Logic Controllers & Modules		
1. Controllers	SIEMENS S1500 S1200 (with Nexteer CE's approval)	
2. Power Supplies	SIEMENS PM	
3. Communication Modules	SIEMENS Compact Switch Modules SCALANCE X-000 SCALANCE X-100	
4. I/O Modules		
a) Chassis Based	SIEMENS	
b) In-Cabinet Distributed (IP20)	SIEMENS INOVANCE GL20	

Machine Controls Electrical	APDL Common / Requirement	Examples
c) On-Machine Distributed (IP65/67)		
1) ProfiNet	Balluff BNI004U - BNI PNT-502-105-Z015 (4 port IO-Link Gateway) BNI005H - BNI PNT-508-105-Z015 (8 port IO-Link Gateway) BNI0053 - BNI PNT-104-105-Z015 (16pt, Single ProfiNet Port) BNI0052 - BNI PNT-302-105-Z015 (16pt, Dual ProfiNet Ports)	
2) Network Interface	Balluff BNI006C - (BNI PNT 502-102-Z015) (8 port, 4 IO-Link) BNI005H - (BNI PNT-508-105-Z015) (8 port, 8 IO-Link) BNI00FW - (BNI PNT-508-005-Z015) (8 port, 8 IO-Link, No display) BNI0092 - (BNI PNT-507-005-Z040) (4 port, 4 IO-Link, No display)	
3) IO-Link	All items listed in SD-007	
5. Communication Gateways	Real Time Automation 460PSA-N34 (ASCII to ProfiNet) 460PSTCP (EtherNet TCP/IP to ProfiNet) HMS Anybus AB7013 (ProfiNet to Serial)	
Q. Programming Port with Receptacle (External access for Ethernet Devices).	All items listed in SD-007	
P. Pushbuttons, Pilot Lights, and Selector Switches	All items listed in SD-007	
Q. Operator ID Systems	All items listed in SD-007	
R. Relay, Control NOTE: Master, control power distribution, and safety circuit relay applications.	All items listed in SD-007	
S. Relay, Interface	All items listed in SD-007	

<p>T. RFID Systems - Pallet / Part Tracking</p> <p>1. Gateways</p> <p>2. Antenna</p> <p>3. Data Carriers</p>	<p>Balluff BNI004U – BNI PNT-502-105-Z015 (4 IO-Link Port, ProfiNet) BNI005H – BNI PNT-508-105-Z015 (8 IO-Link Port, ProfiNet)</p> <p>Balluff All items listed in SD-007 UHF Series</p> <p>SIEMENS RFXXR</p> <p>TURCK UF/UHF with ProfiNet</p> <p>Balluff All items listed in SD-007 UHF Series</p> <p>TURCK UH/UHF</p>	
<p>U. Safety Interlock Switches</p>	<p>All items listed in SD-007</p>	
<p>V. Safety Presence Sensing Devices</p>	<p>All items listed in SD-007</p>	
<p>W. Safety Relay</p> <p>1. E-Stop, Safety Gate, Light Curtain</p> <p>2. Contact Expansion</p>	<p>All items listed in SD-007 Telemecanique XPSAV11113P (with time delayed contacts) XPSAFL5130P XPSAK311144P XPSATE5110P</p> <p>Keyence</p> <p>PILZ PNOZ m Bx</p> <p>All items listed in SD-007 Telemecanique XPSECME5131P</p>	

3. Two-Hand Control	All items listed in SD-007 Telemechanique XPSBCE3110P	
4. Zero Speed Indicator	All items listed in SD-007 Telemechanique XPSVNE1142P	
5. Safety Timer Relay	All items listed in SD-007	
X. Motor Starters / Contactors	All items listed in SD-007	
Y. Support Software Requirements		
1. Programmable Logic Controllers (PLC)	SIEMENS TIA Portal Step7 Version 20.x	
2. Human Machine Interface (HMI)	SIEMENS TIA Portal WinCC INOVANCE	
Z. Disconnect Switches	All items listed in SD-007	
AA. Switches / Sensors	All items listed in SD-007 Festo Pneumatic Sensors SMC Pneumatic Sensors	
BB. Transformers	All items listed in SD-007 Meanwell Omron	
CC. Vision Applications	All items listed in SD-007	
DD. Process Label Printer	ZEBRA With Serial Com Supporting ZPL II Protocol	

8. Manufacturing Information Technology System Components

The "MIT Systems Component" column is organized by components. Nexteer Automotive Asia-Pacific Driveline does not have requirements for technologies not listed.

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- Where components are identified, this is the Nexteer Automotive Asia-Pacific Driveline approved (required) component.
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NOTE: Where an approved supplier is followed by "(Special Applications)," these components may be used but require the Controls Engineer's prior approval.

NOTE: Changes since the last revision are highlighted.

MIT Systems Component	Global Common / Requirement	Examples
A. Computer Hardware	All items listed in SD-007	

RECORD OF REVISIONS

Revision No	Date	Section	Description
001	20AU19	ALL	Initial Release.
002	10DE20	6.V.2,3	BALLUFF UHF, TURCK HF/UHF Added
003	04AU22	ALL	Combined with Nexteer Specification SD-007 and updated per latest Revision.
004	09JA26	ALL	Regular Update
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